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Macroeconomic Management and the Black Market for Foreign Exchange in Sudan

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High exchange rate premiums make controlling inflation more difficult and hurt both official exports and tax revenue from foreign trade. A high premium also accelerates capital flight.

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This paper — a product of the Macroeconomic Adjustment and Growth Division, Country Economics Department — is part of a larger departmental research project on the macroeconomic implications of multiple exchange markets in developing countries. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433 Please contact Victoria Barthelmes, room N11-025, extension 39175 (88 pages). February 1992.

Elbadawi uses a simple general equilibrium model to derive a forward-looking linear solution for the premium on the black market for foreign exchange in Sudan.

His solution accounts for the long-run fundamentals of the premium that operate through the current account balance It also accounts for the short-run determinants of the asset market. Estimates based on Sudanese data broadly corroborate the model's predictions.

Elbadawi's thesis is that successful exchange rate unification and subsequent integration of the parallel market into Sudan's regular economy will require deep fiscal reform and liberalization of trade and exchange rate policies tailored to the pace of macroeconomic reform.

His results show that controlling inflation becomes more difficult under high-premium regimes and that higher premiums hurt official exports and tax revenue from foreign trade. A high premium also tends to accelerate capital flight.

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I. INTRODUCTION

The last two decades in Sudan have witnessed the emergence and subsequent expansion of an active parallel economy. The parallel economic activities have been primarily concentrated in the foreign sector of the economy in the form of: mis-invoicing and smuggling of exports and imports, and diversion of remittances from Sudanese nationals working abroad to the black market for foreign exchange. The portfolio and flow transactions in foreign exchange were settled in this market at a freely determined rate. The floating black market rate have co-existed with an official system of fixed exchange rates, exchange controls, and varying degrees of import rationing. A brief view of exchange rates in Sudan is provided in appendix table (A.1). The long term average evolution of the premium (black market rate over the official) during 1970-1989 is given in annual data in graph (1). The premium which reflects the behavior of the free rate in addition to official policy, including devaluation, has averaged above 170 percent for the sub-period 1970-1987 and over 500 percent for the remaining three years.[1]

Because of the large size of foreign exchange traded in the black market[2] and the extent of the rationed demand for imports, the black market rate is in fact the marginal price for imports and for foreign exchange. Furthermore, its rate of change reflects the opportunity cost of holding domestic currency vis-a-vis holding of foreign exchange or other forms of

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[1]Table (A.1) and graph (1) do not contain the premium with respect to the fixed dual rate which is not available on annual basis. A broader view of the exchange rate system is provided in table (1) of the following section.

[2]The size of just one source of foreign exchange for the black market (the non-official remittance by Sudanese nationals working abroad), averaged more than one billion dollars per annum throughout the 80's (see table (3) below).

durable assets. Therefore the black market is strongly linked to the rest of the macroeconomy and the (endogenous) black market premium is considered to be an important macroeconomic indicator reflecting the inconsistency between macroeconomic policy and the foreign trade and exchange rate regime; and thus it's likely to affect private sector behavior such as expectations of future devaluation as well as government policy reaction. de Macedo (1985) for example argued that the importance of the black market for macroeconomic management in Sudan during the period, derives from the role played by the premium as a relative price signal for lack of credibility on the part of government policies or economic reform. The above description fits the example of many countries from Sub-Saharan Africa that have experienced deteriorating economic conditions during the 80s, and in most cases aborted or incredible attempts at economic reform as well, e.g. Pinto (1987).

In a survey of exchange rate regimes in SSA, Pinto and van Wijnbergen (1987) argued that black market and dual regimes are not only common in Africa, "but a key insight is that part of the current macroeconomic instability in SSA may be due to a failure to adjust policy for the existence of parallel markets."[3] According to this literature therefore, successful and sustainable unification of the black market rate with the official should be a prime objective of economic reforms in those countries, Sudan included. In addition to the often cited efficiency costs associated with the dual regime, a high and persistent black market premium can substantially undermine the allocational role of the real exchange rate in the economy by exposing the credibility problem of macroeconomic policy. Even under the unlikely scenario

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[3]This notion has been formalized and elaborated upon in a series of papers by Pinto (e.g. Pinto (1986, 1987, 1988b)).

of a depreciated black market rate leading to real depreciation in the export sector for example,[4] it does not necessarily follow that investment and other resource flows into this sector will be enhanced. This is because of the increased business risk created by the perceived declining credibility of policy.[5]

Exchange rate unification however, requires explicit consideration of the endogeniety of the premium, and the order of sequencing or the primacy of the policy instruments to be deployed in the reform program. More precisely the work of Pinto (op.cit.) argued for the primacy of fiscal policy and the need to design the pace of exchange rate policy to be consistent with fiscal reform. The driving idea behind this prescription is that: if the fiscal deficit is not sufficiently reduced, premature policy of an accelerated crawl for example, when the public sector is a net buyer of foreign exchange; could lead to unsustainable post unification inflation as the authorities find themselves forced to rely exclusively on higher inflation tax in order to replace foregone implicit revenue derived from the taxation of exports through the premium.

Along the lines of the above discussion we will study in this paper the macroeconomic implication of the black market for foreign exchange and the extent to which the presence of such a sizeable market interfere with macroeconomic management in Sudan. The main thesis of this paper is that successful exchange rate unification and subsequent integration of the

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[4]Devarajan and Weiner (1990) developed a model that predicts real appreciation as a result of a rising premium even if exports are sold at the free rate provided that the marginal cost of labor is determined at the free market.

[5]This effects is what Pinto (1987b) referred to as "reducing the informational content of the real exchange rate."

parallel market into the regular economy will require a strong commitment to fiscal retrenchment as well as a gradual pace of exchange rate unification and foreign trade liberalization tailored to the pace of fiscal reform. While this finding is broadly consonant with the evidence obtained for other Sub-Saharan African countries, e.g. Pinto (op.cit.); our results show that what is relevant for explaining the evolution of the premium for given levels of fiscal deficit and trade policy, is agents' expectations of future devaluation and not just the actual exchange rate policy being implemented.

Another point of departure from previous analysis (as shown by our results in Section IV.1 of this paper) is that the potential trade-off between the inflation tax and the implicit tax via the premium is not automatic or necessarily significant depending on the extent to which the accompanying trade and exchange rate liberalization policies - for example through its influence on the premium - expand the tax base on foreign trade and other transactions on the "legalized" free foreign exchange market.

Section II of this paper provides an overview of major macroeconomic development and the evolution of policies in the areas of exchange rate and foreign trade. A detailed discussion of the motives and causes behind the official policies deployed in the areas of foreign trade and payment regime is provided in appendix I to this paper. The structure of the foreign exchange market will be described and analyzed in section III. In section IV, I will employ a simple model of the dual exchange rate to study the macroeconomic and foreign trade determinants of the black market premium. This framework will be used to study the interactions between the premium and other major macroeconomic indicators, including an econometric analysis of the premium effects on key macroeconomic variables. A more rigorous level of analysis of

the flow and asset market determinants of the premium will be conducted in section V based on an empirical forward looking model of the black market premium. Finally section VI draws some implications of the paper's findings for economic reform and adjustment in Sudan.

II. AN OVERVIEW OF EXCHANGE RATE AND FOREIGN TRADE REFORM: 1970-1990.

Sudan, the largest country in Africa, has experienced sharply declining economic fortunes since prior to the end of the seventies decade to the present. Despite its enormous natural resource base and relatively skilled labor force, the country could only manage to achieve a growth rate of 2.9 percent per annum for the FY1976-89 period and with its high population growth this amounts to an 11 percent reduction in real per capita income over the last 14 years. According to a recent World Bank study Sudan's exports fell by 1.4 percent a year over the 80's leading to a decline in the country's share of merchandise exports by 46 percent over the decade. Domestic saving on the other hand fell from 13 percent of GDP in FY 1976 to an average of only 4 percent over the 80's.

The inadequate domestic saving required reliance on external borrowing and resource to domestic credit expansion for the finance of the ambitious development program that spanned the second half of the 70's and the early 80's. As a result, Sudan outstanding external debt reached US$ 6 billion in 1984 and is currently estimated at US$ 13.9 billion about 60 percent of which is expected to be in the form of arrears. As further external financing became difficult, public expenditure had to be curtailed with the brunt of the cuts borne by public spending on investment, imports, and human and social sectors. Consequently the high investment (22 percent of GDP) rates achieved up to the early 80's declined to less than 10 percent of GDP in FY1989 and is expected to go down even further for the current fiscal year.

Sudan had more than its share of political instability with the

lingering civil war becoming increasingly costly.[6] It has also recently experienced adverse exogenous shocks in terms of severe droughts during 1982-85 and flood and locust in 1988. It is generally agreed however, that the poor economic performance of Sudan remains by and large a legacy of a long history of domestic economic policy mistakes. The 70s decade marked the beginning of an era characterized by expansive macroeconomic policies aimed at supporting a massive economic development program. With government revenues barely meeting current expenditure and no financial markets available, the authorities relied heavily on currency issue and external financing. For example broad money supply increased from LS 2.8 million in 1970/71 to a staggering LS 877 million in 1978/79.

On the other hand, Sudanese foreign trade and payment regime has been one of full exchange control and highly regulated current account transactions since prior to the country's independence in 1956. Also the exchange rate was fixed at LS 0.35/US$. Clearly this arrangement was not consistent with the expansive macroeconomic policies of the 70s and the other exogenous shocks of the oil price hikes of the mid 70s and its aftermath. In an attempt to limit the adverse inflationary and appreciationary consequences of these policies-particularly for the foreign sector, the authorities introduced a dual exchange rate system and special foreign trade schemes as early as the second half of the 70's decade. The authorities however, have relied primarily on foreign trade and other economy wide controls in order to suppress excess aggregate demand. The limited exchange rate and foreign trade reforms could not keep pace with the vastly deteriorating macroeconomic conditions, and the

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[6]Since its independence in 1956, Sudan has experienced a civil war in its Southern region except for 12 years (1972-1983) during which a peace agreement was in effect.

elaborate ensemble of economic controls achieved nothing but to pave the way for the development of a sizable parallel economy, (for more details see appendix I).

The conditions of highly rationed demand for imports constituted a strong current account link for the black market for foreign exchange. After 1973 Sudan developed into a major labor exporting country with the remittances sent by Sudanese nationals working abroad (SNWA) accounting for more than 3 times the foreign exchange earnings out of exports. This provided for an enormous source of supply of foreign exchange for the black market. Actually the goal of enhancing the share of SNWA remittances channelled through the official market became the most important determinant of exchange rate and foreign trade policy. This policy which also aimed at segmenting SNWA remittances from the rest of the economy did not succeed however. Despite a smaller spread of the free rate over the dual (compared to the free/official premium), such premium averaged close to 140 percent (see table 1), and it appeared to be enough to cause a significant share of SNWA remittances to flow through the black market, see section III below. Also the presence of informal "off-shore" markets in the major receiving countries of Sudanese migrant workers rendered domestic enforcement efforts of exchange control ineffective.

The large capital inflows and excessive monetary expansion that permitted the massive spending spree during the second half of the 70's have created substantial real appreciation and thus facilitated the expansion of the black market and the economy started to assume crisis proportions. By September 1979 an agreement with the IMF was concluded. This will mark the beginning of a series of an IMF style stabilization and liberalization

programs that dominated virtually all of the 80's decade. Apart from the merits of the liberalization strategy, the experiment was surrounded with considerable confusion due to the extensive and often contradicting policies issued by the authorities during this period. In the words of Umbadda (1986), "It is rather difficult, if not impossible, to trace all the developments that took place during the period 1979-1986 in the trade and payment regime. The country looked more like an experimental laboratory than a real life country. During the period, the Bank of Sudan alone issued more than (400) circulars, regulating movements of payment and commodities between the official, the parallel and the free market."

The major episodes are recorded in table 1; also a detailed description is provided in the appendix. At any rate, the central policies emphasized by the package are twofold: successive devaluation and continuous shifting of imports (and to some extent exports) from the official market to the "legalized " free parallel market. This way, it was envisaged that exchange rate unification will ultimately be achieved and the parallel market will be integrated into the regular economy or perhaps squeezed to just a 'side show'. Unfortunately the quest for liberalization in Sudan has been a dismal failure, and the black market continued to expand as economic conditions deteriorated even further as indicated above. With unsustainable macroeconomic policies, the experiment has widely exposed the credibility problem of the government, thus rekindling expectations and widening the parallel market. After a decade of liberalization attempts, Sudan now has moved full circle back to total import bans and exchange control enforced by harsh measures including the death penalty.

III. THE FOREIGN EXCHANGE MARKET IN SUDAN

The previous section provided a brief review of the policies involved in the areas of foreign trade and payment regime. In this section we discuss the structure of the foreign exchange market and its current account links to SNWA remittances and the market for goods and services. An analysis of the structure of the foreign exchange market that assesses the extent of its competitiveness and the nature of its sources and uses, is essential for subsequent analysis that formalizes the interaction between this market and the macroeconomy and for the design of policies aimed at improving resource allocation through macroeconomic management. Given the importance of the black market in Sudan, the black market premium becomes an indicator with important macroeconomic significance. A formal assessment of this link to the macroeconomy will be addressed in the next two sections.

In the last part of this section I will analyze the statistical characteristics of the premium (and the free rate) and their non-economic determinants such as seasonal factors and bubbles. As we saw from the previous section, trading in foreign exchange (be legalized or not, inside the country or in the off-shore markets) has basically continued unimpeded for most of the last two decades, even though it was only after the IMF inspired liberalization of September 1979 that the market expanded rapidly to become a major sector in the economy. We will therefore interchangeably use "black" or "free" to refer to the same thing.

1. The Structure of the Market

The free foreign exchange market in Sudan is composed of two main channels: the private and public commercial banks, and the private licensed

and unlicensed dealers. Actually the commercial banks, being subjected to the government imposed maximum selling and buying rates (see table 1), were in fact operating on a managed or a moving peg environment. The main supply of foreign exchange through the banking system is provided by the proceeds from nontraditional exports. As for SNWA remittances, the main primary source of foreign exchange;[7] an average of about only 20 percent is believed to flow through the official channels (which includes the banking system), thus leaving the private dealers with about 80 percent of the sizable SNWA remittances.

The licensed dealers who normally have established business ties including access to banks and non-banks credit, work closely with a larger number of unlicensed dealers. Each licensed dealer would have an "army" of such unlicensed dealers who either work as middle men between the licensed dealer and the holders of SNWA foreign exchange, or they may simply be working for the dealer to hunt for sellers through their direct "street" persuasion. The selling side of the trading activities of the licensed dealers was also frequently mediated by another set of dealers.

The rationality of such arrangements is explained by two accounts: first it may reflect a relative lack of information on the part of primary suppliers, and second it may be consistent with a rational risk averse behavior on the part of sellers and buyers in the market especially after the authorities attempt more aggressive measures at enforcing regulations, USAID-Sudan(1985). According to the USAID study 70 percent of the foreign exchange supplied by the primary source is received by the licensed private dealers

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[7]For example the size of total SNWA remittances is estimated to average $1.6 billion per annum for the 1980/81 to 1988/89 period, (see table (2)).

through the unlicensed street dealers. The customers of licensed dealers are mostly foreign firms, private business, commercial banks, and some government entities. Also according to the above study about 60 percent of the demand for these customers was satisfied through middlemen. Under non-normal conditions when the authorities attempt at enforcing a maximum rate for example or when the market is tight, the "trusted group" of middlemen- who usually tend to have the trust of the two parties- were believed to have mediated as high as 95 percent of the foreign exchange sales to end users.

The structure of the free market by currency composition shows a large share for the dollar averaging more than 70 percent for the buying transactions and more than 80 percent for the selling transactions. The other major currency the Saudi Rayal comes as a distant second. In terms of firms concentration the number of authorized dealers during legalization was large and was increasing especially during 1984, and many of them had a very small share of the market.[8]

The homogenous product (the dollar) and the relatively lenient conditions set for entry and exit from the market (when it was legal) may explain the above evidence. The foreign exchange market however, is still judged not to be fully competitive. While dealers tend to be well informed about market conditions (using telephone communications among themselves), the large number of small primary suppliers and some of the end users were usually not so informed. This is a factor that explains the observed discrepancies in the daily prices. As we noted above the lack of full market information also

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[8] de Macedo (1985) computed a measure of concentration based on Herfindhal index for 1984 equal to 5.6. In comparing this finding to other similar computations obtained for U.S. auto firms (e.g. Dixit (1985)), he concluded that this shows a degree of competition in Sudan foreign exchange market far greater than generally believed.

partially explains the reliance on "street dealers" by the more established traders in the market. The market also may sometimes "lapse into a buying oligopsony and selling monopoly" because of the seasonality that characterize supply and demand and also because some dealers have relatively larger share than others. The market however is generally viewed to have been competitive enough to ensure the uniformity of the quoted rates among dealers, de Macedo (1985), and USAID (1985).

2. The Current Account Link, Capital Flight, and the Role of SNWA Remittances

Table 2 shows the importance of SNWA remittance as a source of foreign exchange as compared to other relevant indicators in the economy such as exports, imports, and GDP. Even though the size of remittances transferred through the official channels comprised only about 20 percent of the total, it has an average ratio of 48 percent with respect to commodity exports,23.4 percent with respect to imports, and 4.2 percent with respect to GDP since 1980/81. This leave the rest of SNWA remittances (about 80 percent of total) to be available to meet the flow and asset demand for foreign exchange through the free foreign exchange market, (table 2). As shown in table 3, the share of imports financed through the free market has been high even before the September 1979 liberalization. After legalization of the free market in 1981 this share have averaged 39.4 percent of total imports.[9]

It can also be seen from the table that the size of the remittance flows to the free market tend to be consistently larger than the value of imports

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[9]If the years 1985/86 and 1986/87 were excluded this share will rise to 52.5 percent.

financed through this market. The ultimate private or unreported current account surplus may be smaller than what may be obtained from table 3 since other flow demands such as tourism, education are in fact financed through this market as well. The data on table (3) on the other hand understates the true supply for the free market since there are other potential sources such as mis-invoicing and smuggling of exports and imports. Despite the possibility of market thinness at times of high seasonal demand or when liberal import policies were pursued, the general view is that there were more frequent surpluses than not in the private current account in Sudan. This story is also consistent with our estimates of capital flight contained in table (4). The methodology for computing the capital flight estimates is based on Dornbusch (1985) and is adapted to account for SNWA flows through the unofficial market and the own funds imports. See appendix II for a description.

The ratios of capital flight (column (1)) to the change in the stock of debt and to GDP are shown in columns (2) and (3) of table (4). Even when using our more conservative measure of capital flight - see appendix II below - it is clear from the above ratios the extent of the damage capital flight may have inflicted on the economic fortunes of Sudan. If the authorities in Sudan were able to contain this phenomenon during the seventies and eighties, the current debilitating debt problem facing the country would not have materialized. Also capital flight is judged to be harmful due to the foregone growth potential that it caused and which presumably has a high social rate of return for a developing agrarian economy lacking basic physical and human infrastructure such as that of Sudan. Other potential negative effects of capital flight that have been analyzed in the literature that may

be applicable to Sudan; include the erosion of the tax base, the negative impact on domestic investment and the increased marginal cost of foreign borrowing.

The undesirable macroeconomic and development consequences of capital flight has been convincingly explored in Dornbusch (1985), Cuddington (1986) and have further been elaborated for the case of Sudan in Ali (1988), and more recently for Latin America in Pastor (1990). The most critical question to consider is what role, if any, trade and financial liberalization played in accelerating capital flight in Sudan? and should exchange control be considered as a remedy? I intend to address this issue in the next section when I discuss a set of simple econometric models analyzing the role of the premium in the determination of key macroeconomic indicators, including capital flight.

3. Statistical Characteristics of the Black Market rate and Premium

It is obvious from the above description that the free market for foreign exchange is quite sizable and therefore its interaction with the rest of the economy is bound to have important implications for policy. Tables (5) and (6) provide some basic statistical data on the free rate and the premium of the free rate relative to the official. Both tables are organized in such a way so as to distinguish between the episodes described in table (1) of the previous section.

According to tables (5) and (6) both, the free rate and the premium, have displayed relatively stable behavior throughout the period before February 1985. The brief suspension of private trading in foreign exchange during May-Dec., 1983 of this period have not in fact been perceived as

permanent since the free rate continued to increase and the premium only slightly declined. In fact this brief suspension period exhibited considerably less volatility as compared to the previous period. The following sub-period of January 1984-January 1985 which marked the re-legalization of private foreign exchange trading continued to be characterized by stable behavior.

The post February 1985 period however, witnessed significant jumps in both the size and variability of the two rates. This period which marked the beginnings of official ban of private trading in foreign exchange also witnessed an increasingly concerted effort by the authorities at enforcing this ban, a matter which culminated with the new military government imposing the death penalty on alleged violators.

From the above discussion it appears that the free market for foreign exchange has functioned smoothly, and that if any speculative bubbles do exist they must have developed at a later stage, perhaps as a reaction of risk averse agents to the cumulative effects of erratic policy mistakes. The availability of weekly and daily data on the black market rate for the period of May 1980 to February 1985 permits a test for bubbles on a finely sampled data set as well as a comparison of the characteristics of the daily and weekly data to the quarterly data. Figures (2) gives a closer view of the foreign exchange bubbles for the post January 1985 period. To test (or assess) for the existence of such bubbles we analyze the stationarity and the distributional characteristics of the black exchange rate. According to Table (7), while all series considered (quarterly, monthly, weekly and daily) are not stationary at the levels, differencing seems to achieve stationarity in all cases except for the daily data. According to both, the Dickey-Fuller

(DF) and the augmented Dickey-Fuller (ADF) tests, we could reject the null hypothesis of a unit root in the rate of change series for the quarterly, monthly and weekly data. Hence these series are difference stationary. The daily series however, failed the ADF test. The individual hypothesis of zero skewness and zero excess kurtosis on the other hand, can be rejected for all the series at any reasonable significance level. Furthermore, this apparent departure from normality in the unconditional distribution of the free rate, is significant for both levels and differences for all the series as evidenced from the skewness and Kurtosis tests.

The indirect tests of table (7) suggest that while bubbles - possibly generated by seasonality, market thinness, or reaction to erratic domestic policy mistakes may exist especially for daily data of the free exchange rate in Sudan; this does not necessarily invalidate the relevance of economic fundamentals to the determination of the free rate in the horizon of quarterly and annual data -- the type of data commonly used in economic analysis. In fact I will show in section V that the quarterly data on the premium is cointegrated with economic fundamentals, table (A.2). As such, a bubbles' solution cannot exist in the case of quarterly exchange rate data in Sudan.[10] Furthermore, the potential for the existence of bubbles in the data should not be associated with irrationality of market participants. Rational asset market bubbles can exist in a world of risk-averse agents with heterogenous information set, see Blanchard and Watson (1982), and Meese (1986) for example.

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[10]See Kaminsky (1988) for a discussion on the nonexistence of bubbles under cointegration.

IV. THE FOREIGN EXCHANGE MARKET AND MACROECONOMIC DEVELOPMENTS IN SUDAN

Table (8) shows the evolution of the black market rate and premium around devaluation episodes. A typical pattern that emerges is that the success of official devaluations has been of only temporary nature. As shown by the table the premium came down only for the month of the devaluation or at most for the one or two following months. Furthermore, even the achievement of such a modest gain required rather massive devaluations and when only a moderate official devaluation was effected (as in September 1979 for example), the premium actually increased rather than decreased, see table (8). Another general pattern is the familiar expected devaluation - driven rise in the premium and in the rate of depreciation of the free rate observed for the few months prior to devaluation. Finally, it can be observed that the premium displayed a rising long term trend.

In the previous section we emphasized the statistical characteristics of the premium (and the free rate) and the effects of seasonality and the potential for the existence of bubbles in the very short run (daily data). In this section I will attempt to explain the above story in the context of the existing analytical results of the literature on multiple exchange rates.

Subscribing to the environment described above for Sudan, we assume a dual exchange rate system where an officially sanctioned share, z, of a given total private exports, $\bar{X}$, are required to be surrendered to the authorities at the official exchange rate E_o. The rate of crawl of the official rate is fixed at π. Also a share, v, of total private sector imports, $\bar{I}$, is allowed through the official market at the rate E_o along with the exogenously given government imports, $\bar{I}g$. The rest of the commercial

transactions are settled at the black (free) market according to the freely floating dual, rate, E_b. No financial transaction are legally allowed but as a result of mis-invoicing of exports and imports, illegal capital accounts transactions take place at the black market according to the rate, E_b. The stock of foreign assets held by the private sector, F, will therefore change according to the position of the unreported current balance of the private sector. Private sector financial wealth is given by:

$$W = M + E_b F \qquad (1)$$

Assuming that E_b represents the marginal price of imports, aggregate private sector imports is described by:

$$\bar{I} = a\left(\frac{M + E_b F}{E_b}\right) = a\left(\frac{m}{q} + F\right) \quad , 0<a<1 \qquad (1)$$

where $m = \frac{M}{E_o}$ and $q = \frac{E_b}{E_o}$ is the black market rate premium.

The official current account balance is equal to the change in reserves, $\dot{R}$, and is given by:

$$\dot{R} = z(1-\phi)\,\bar{X} - v^{*}\, a\left(\frac{m}{q} + F\right) - \bar{I}_g \qquad (2)$$

where ϕ is the under-invoicing ratio (mostly migrant workers remittances in the case of Sudan).

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[11] Equating official current account balance to the change in official reserves clearly abstracts from external debt accumulation. For the case of the Sudan, such assumption may be difficult to justify, especially over the first half of the 1980s. In the analysis of this section, the story of Sudan's external borrowing is taken into consideration, however. Furthermore, in the next section -- where we estimated a linearized rational expectation version of this model using quarterly data -- the abstraction from the debt aspects will be necessitated by empirical considerations.

The unreported current account balance on the other hand is equal to $\dot{F}$ where,

$$\dot{F} = [z\phi + (1-z)\bar{X} - (1-v)\bullet a(\frac{m}{q} + F)^{12} \quad (3)$$

We make the usual assumption that domestic credit creation is used to finance the public sector deficit,

$$\dot{D} = E_o (g-t)^{13} \quad (4)$$

Since the nominal stock of domestic money M is given by

$$M = E_o R + D \quad (5)$$

(4) and (5) lead to the following path for the change in the stock of real domestic money:[14]

$$\dot{m} = z(1-\phi)\bar{X} - v\bullet a(\frac{m}{g} + F) - \bar{I}_g + (g-t) - \pi m \quad (6)$$

The model is closed by specifying the asset market equilibrium. Since the opportunity cost of holding domestic money relative to foreign money is given by the expected rate of depreciation of the free rate; by assuming

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[12]For simplicity we are abstracting from imports over-invoicing and outright smuggling of exports and imports. The other more important transactions of under-invoicing of remittances and the rest of exports however, are captured through ϕ.

[13] This assumption also abstracts from the fact that not all credit creation is to finance budget deficits. But this is a reasonable approximation, since the share of government in domestic credit expansion has consistently been in excess of 60%.

[14] Differentiating equation (5) gives $\dot{M} = \dot{E}_0 R + R\dot{E}_0 + \dot{D}$, by making the plausible assumption that official reserve appreciation after devaluations are not monetized (ie $\dot{E}_0 R = 0$), hence we have $\dot{m} = \dot{R} + \frac{\dot{D}}{E_0} - m\pi$.

perfect foresight we have,

$$\frac{M}{M+E_b F} = \lambda\left(\frac{\dot{E}_b}{E_b}\right) \text{ , and } \lambda'(\ ) < 0 \qquad (7)$$

which can be restated as:

$$\frac{m}{m+qF} = \lambda\left(\frac{\dot{q}}{q} + \pi\right) \qquad (8)$$

Variants of the above simple model constitute a common framework of analysis in the dual exchange rate literature, see e.g. Lizondo (1987a,b), Kiguel and Lizondo (1988), Dornbusch (1986), Dornbusch et al. (1983), and Pinto (1987, 1988, a, b). Analysis of the above model will require solving the system of the three differential equations: (3), (6), and (8).

To keep matters trackable, we impose the condition that $\dot{R} = 0$. For the case of Sudan this seems to be a perfectly realistic assumption since the average of the change in official reserve during the period under consideration (1970-1989) is equal to a minuscule U$ 0.23 million per quarter, even through it experienced considerable variation during the period.

At any rate the monetary rule ($\dot{R} = o$)[15] simplifies matters considerably since the above system of differential equations will become sequential and

the condition $\dot{m} = 0$ gives: $m^* = \frac{g-t}{\pi}$ (9)

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[15] The condition $\dot{R}=0$ is referred to as a monetary rule in terms of its implications for the stationary level of the stock of real money (equation (9)), but in fact it amounts to a trade policy rule where import "quota" enforced through foreign exchange rationing is equal to current export revenue.

which is independent of $\dot{F}$ and q. Also with $\dot{R} = 0$ equation (2) implies that:

$$\bar{X} = \frac{1}{z(1-\phi)} \bar{I}_q + \frac{v.a}{z(1-\phi)} \left(\frac{m}{q} + F\right) \tag{10}$$

Using (10) in (3), the stationarity condition $\dot{F}=0$ gives,

$$\frac{m}{q} + F = \frac{K(v,\ z,\ \phi)}{a} \tag{11}$$

with $K'_v > 0$, $K'_z < 0$, and $K'_\phi > 0$

And from (8) the stationarity condition, $\dot{q}=0$, gives:

$$m = \frac{\lambda(\pi)}{1-\lambda(\pi)} \cdot qF \tag{12}$$

Finally using (9) in (11) and (12), we obtain the other two stationary solutions.

$$F^* = (1-\lambda(\pi)) \frac{K(v,\ z,\ \phi)}{a} \tag{13}$$

$$q^* = \frac{a}{K(v,\ z,\ \phi)} \cdot \frac{g-t}{\pi.\lambda(\pi)} \tag{14}$$

The above derived stationary equilibrium solutions (especially the one for the premium) will be the focus of the analysis for the remaining of this sub-section. In the next section we will use a linearized rational expectation version of this model to estimate the determinants of the premium.

Equation (14) above links the steady state level for the premium with the fiscal deficit. The equation calls for a strong role for fiscal retrenchment while a policy of accelerated crawl is being pursued when there

is considerable flight from domestic money and the policy objective is to reduce the level of the premium and to achieve ultimate unification of the two rates. This is because a policy of accelerated depreciation by itself may lead to only a slight reduction in the premium and in the extreme case when $|\frac{\lambda'(\pi).\pi}{\lambda(\pi)}| > 1$, the premium may in fact increase at the steady state, Pinto (1987). The need for fiscal adjustment is made all the more important when as happened in Sudan a policy of asymmetric trade liberalization (based on higher priority given to import liberalization than to export) - is also being pursued. In terms of the model parameters this will lead to a more reduction in v relative to z, hence other things equal the premium will increase at the steady state.

The experience of the Sudan clearly suggests that the effect of the rate of crawl as a determinant of the premium must be balanced against the potential effect of the real fiscal deficit, g-t, on the premium. Even if we assume that increased rate of crawl leads to reduced premium level for Sudan, tables (9) and (10) show that while the average annual rate of devaluation registered above 32% for the 1978-1987 period as compared to zero for the previous sub-period 1970-73, and 1974-1977; both the primary and total fiscal deficits as ratios to GDP has risen considerably during the last period. This perhaps partially explains that despite massive devaluations during this period, the premium did not only remain steady with respect to past levels but have in fact registered a slight increase. During the last two years 1988-89, when devaluations were suspended and fiscal deficit soared, the premium increased by almost 100 percent.

The story of monetary emission is entirely consistent with the fiscal story, a matter which ratifies our assumption of a basically accommodating

monetary policy imbedded in the monetary rule ($\dot{D} = E_0(g-t)$). The growth in real domestic credit (deflated by the official rate) has risen considerably during the 1974-1977 with an annual average rate of growth equal to 37 percent. This period witnessed an era of massive spending spree aimed at supporting a rather ambitious development program. This program brought impressive growth performance at an average of more than 10 percent in real terms, see table (11). The almost total reliance of the program on external borrowing and deficit financing, however, resulted in a deficit of about US$232 million in the current account and mounting debt problems, see table (12).

The other set of factors that influences the premium relate to trade policy and the composition of aggregate output. The trade liberalization policies adopted in Sudan since the mid seventies and especially after September 1979 basically aimed at utilizing SNWA savings in order to finance much need consumer goods and other non-consumer imports. This required successive shifting of imports from the official market to the free market with its more depreciated rate. The increased flow demand for foreign exchange resulting from this policy is captured in the model through the parameter v, which leads to higher q and lower F at the steady state. On the other hand liberalization of exports has been rather limited and only marginal exports were allowed to be traded through the free market on a consistent basis. As such the destabilizing effect of import liberalization could not be adequately ameliorated by an export liberalization effect working through the parameter, z, to reduce the premium.

1. The Black Market Premium and Macroeconomic Performance

The declining economic fortunes of the country paved the way for the implementation of the exchange rate, trade and financial liberalization that started after September 1979. The rate of growth of domestic credit continued to be quite high, however. During 1978-1987 period the rate of growth in real domestic credit declined to the still high 28 percent, and during the last period (1988-89) it even matched the levels set for 1974-1977 period, table (10). Under the exchange rate policy pursued during liberalization, such monetary and fiscal policy are certainly inconsistent especially with regard to the objective of reducing the premium rate and achieving ultimate exchange rate unification. The high and rising premium ensured a continued deterioration in the reported external accounts and a rising capital flight as the sizable share of SNWA remittances continued to flow through the unofficial channels.

A key factor behind the potential effect of the premium on economic performance is its influence on the official real exchange rate. Kiguel and Lizondo (1988) showed that a rising premium leads to real appreciation.[16] Also using an empirical model of real exchange rate determination, Elbadawi

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[16] Following Kiguel and Lizondo (1988), we can write the following equilibrium in the nontraded goods sector:

$$\frac{1}{P_N}\ [b(M+E_bF) + G_N] = Y_N$$

where P_N is the price of nontraded goods, G_N is government expenditure on non-tradeables, Y_N is nontraded output and b is a constant such that $0<b<1$. Now defining the official real exchange rate by $r=E_o/P_N$, we have:

$$r.b.(m+qF) + g_N = y_N$$

Therefore a rising premium is consistent with rea. appreciation.

(1989), found the premium to be a major channel through which expected devaluation and monetary emission can cause real appreciation. The evidence on real exchange rate movement in Sudan attest to this finding. As shown in table (13) the real exchange rate has experienced considerable appreciation during the post September 1979 period. This appreciation is also consistent with perhaps considerable real overvaluation since the fundamentals (terms of trade, export and import policy) clearly indicate a depreciating equilibrium real rate. Furthermore, the higher capital flows of the 1978-87 period were not sustainable afterwards, table (13). This story is also consistent with the worsening growth performance of the economy and the declining shares of investment and saving in GDP, table (11).

The inadequacy of the official exchange rate policy is further aggravated by the interest rate policy which kept the interest rate at ridiculously low rates see table (14)[17], which also explains the minuscule share of saving in GDP and the extremely high ratio of consumption, table (11).

For the remainder of this section we will discuss the results of simple econometric models emphasizing the role of a high and a rising premium -- such as the one in the Sudan -- in the determination of selected key macroeconomic variables: capital flight, official exports, and tax revenue on foreign trade. I will also analyze the effect of the various regime shifts (in terms of the premium levels and different foreign trade and payment arrangements) on domestic inflation. Table (15) contains the results of the econometric estimation. Starting with foreign trade tax revenue (averages more than 60%

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[17]Interest rates were abolished in the Sudan effective 1984, but reintroduced in 1987 under the rubric 'Compensatory rate system'.

of total tax revenue in Sudan), I estimated two models, one with real tax revenue on foreign trade (FTAXP) as a dependent variable, and the other with the dependent variable given by the ratio of foreign trade tax revenue to GDP (FTAXY). Both models' results show significant and negative effect for the premium. A high and rising premium leads to declining officially sanctioned exports, and consequently official import decline as official foreign exchange proceeds go down; if in addition officially sanctioned imports do not rise high enough to compensate for this decline, the tax base on foreign trade will shrink. The official real exchange rate (RER = E_0/CPI) has a negative effect on FTAXP which indicates that the import reducing effect of real depreciation outweighs its export expanding effect, leading on balance to a smaller tax base and tax revenue. On the other hand, the RER has exactly the opposite effect on FTAXY. In both cases however, the RER effect is only marginally significant. For the FTAXY model, we could not reject the plausible hypothesis of a unitary elasticity for real output, the same effect is also positive in the FTAXP model but is only marginally significant, however. For both models, the period 1983-87 has been one of low fiscal effort due to the dramatically reduced share of the official (reported) economy in Sudan over this period.

A closely related macroeconomic performance indicator estimated in Table (15) is official merchandise exports. The reason why I decided to consider exports rather than official trade or current account balances is because official imports is by and large determined by official foreign exchange availability. The results show strong and significant negative effect for the premium (E_b/E_o) on official exports, with a 10% rise in the premium leading to a 1.6% age points of GDP decline in official exports. The real exchange rate

relevant for official exports (PX/PN)[18] on the other hand, has a significant and appreciable positive effect. A real depreciation in (PX/PN) of 10% raises official exports by 12.2% age point of GDP. Finally an increase in current income over its trend leads to higher exports in absolute terms, but to a lower official exports as a ratio to GDP.

The final macroeconomic indicator estimated in Table (15) is capital flight given in 1980 fixed US dollars (KFLT)[19] and as a ratio to change in the stock of foreign debt (KFLTDEBT). In both models, the premium has a positive effect. In the case of the KFLT model the premium effect is only marginally significant, however. The inadequacy of the interest rate policy referred to earlier is reflected in the positive and significant influence on capital flight due to world interest rate (WIRATE)[20] obtained for both models. The period 1973-76 and 1985 witnessed unusually high KFLTDEBT ratios as reflected in the positive coefficient of the two corresponding dummies. The first period may simply reflect initial reactions to the beginnings of the worsening economic conditions in Sudan while the country's indebtedness was still quite low. The 1985 spike in the KFLTDEBT ratio seems to be precipitated by the authorities aggressive attempts at enforcing the exchange control which started in February or by the increasing political instability that ultimately led to the March-April popular uprising and the change of government in April 6 of the same year. The absolute level of capital flight (KFLT) on the other hand, which has been rising steadily over the period, took a steep rise in

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[18] Where PN is the price of nontradables. The data for PX and PN was obtained from Elbadawi (1987, 89).

[19] The estimates for capital flight are obtained from table (4).

[20] WIRATE is equal to annualized LIBOR on three months US dollar deposits.

1987 -- the year that witnessed the last devaluation in the Sudan, before declining sharply in 1988.

At the conclusion of Section III above we discussed the potential negative effects of capital flight on the Sudan economy, and we asked the question: What role, if any, trade an financial liberalization played in accelerating capital flight in Sudan? and Should exchange control be considered as a remedy? The results discussed above provide a strong support to the view that holds inadequate or incredible reform - such as Sudan's post September 79 IMF-type stabilization programs - to be responsible for capital flight through its influence on the premium. This point is echoed in Ali (1988) and Pastor (1990); the strong emphasis on exchange control as a remedy for capital flight in Sudan as argued in Ali (1988) is rather dubious, however. As long as macroeconomic conditions are conducive to capital flight, it will be difficult to stop capital flight in Sudan given the potential for off-shore market dealings in the receiving countries of SNWA. In fact this assertion has been attested to by the recent experience of Sudan where capital flight rose significantly when the authorities attempted to enforce the exchange controls.

The final issue I address in the context of macroeconomic implications of the premium is the potential inflationary effect of a rising premium. First of all the premium will have a direct effect on domestic inflation through the price of tradeables. Second, the change in the premium (or the black market rate) may reflect the influence of excess money supply on inflation. Under fixed exchange rate and official exchange control designed to protect official reserve, an ex ante increase in the supply of money will lead to an ex-post rise in the premium and inflation in order for the given

stock of money to be held. The most important effect on domestic inflation of extended and high premium episodes--such as the one experienced by the Sudan, could however; be generated by their influence on expectation of future inflation and on the persistence of inflation, since the existence of such episodes suggests that future devaluations are likely and that macroeconomic policy is not sustainable. As shown in table (9) a rising black market premium during the last two sub-periods, 1978-87 and 1988-90 has been consistent with higher inflation.[21] The quarterly inflation rates increased from an average rate of about 3.8 percent for the 1974-87 period to an average of 6.6 for 1978-87 and increased by more than three times reaching an average of 14.8 percent for 1988-90.

Cochrane (1988) suggested the following variance ratio test:

$(1/k)\ var\ (\pi_t - \pi_{t-k}) / var\ (\pi_t - \pi_{t-1})$ in order to measure the persistence of

shocks in any variable (inflation in our case). This ratio will be equal to one if inflation follows a random walk process, and it converges to zero if it follows a stationary process. Table (16) and Figure (3) report Cochrane's variance ratio statistic for different values of k for four major episodes over the 1970, 1 - 1990, 2 period. The results show that even though inflation in the Sudan remains stationary over all the episodes, shocks to inflation tend to be more persistent in later episodes, however. This implies that the high premium regime (1988-90) have been less effective in eliminating inertia in inflation relative to the lower premium episodes.[22]

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[21] The implication of this is that parallel foreign exchange cannot stop inflation.

[22] This does not mean that the premium is the main thing that matters. Rather, it is entirely possible that exogenous shocks or policy instruments are influencing both variables.

V. AN EMPIRICAL MODEL FOR THE PREMIUM

In this section I will estimate a linearized forward-looking version of the model of the above section. The economic environment in question, as described above, is one of a sizable black market for foreign exchange in which 'illegal' albeit relatively riskiless currency substitution takes place at a premium rate. This market is assumed to be strongly linked to the rest of the economy; specifically to the money market and the foreign trade sector. The specification of the premium which I will solve for in this model will be consistent with equilibriums in both the asset market and the current account balance. Starting with the asset market we posit the following relative asset demand equation:

$$\log \frac{m_t}{q_t F_t} = a_0 - a_1 \hat{E}^e_{b_{t+1}} \tag{15}$$

This equation is a linearized version of equation (7) of section IV above. We also have, $\hat{E}^e_b$, the expected rate of depreciation in the black market given by:

$$\hat{E}^e_{b_{t+1}} = \hat{q}^e_{t+1} + \hat{E}^e_{0_{t+1}} \tag{16}$$

Now let us assume that expectations are rational and that $\hat{q}^e_{t+1}$ and $\hat{E}^e_{0_{t+1}}$ are given by:

$$\hat{q}^e_{t+1} = E_t(\Delta \text{Log } q_{t+1}) \equiv t\Delta \log q_{t+1} \tag{17}$$

and

$$\hat{E}^e_{0_{t+1}} = E_t(\Delta \log E_{0_{t+1}}) = t\,\Delta \log E_{0_{t+1}} \tag{18}$$

where Δ is the difference operator.

The above set of equations suffices for the asset market equilibrium. For the current account I will continue to assume that the official (reported) balance is zero i.e. $\dot{R} = 0$. As we noted in the previous section this amounts to a monetary (or foreign trade) rule that also simplifies the model considerably.

Formally I will write the unreported exports, X_u, and unreported imports, I_u, in the following generic forms:

$$X_u = X_u \underset{(+)}{(e} , \underset{(+)}{\frac{E_b}{E_0(1-t_x)}} ; \underset{(-)}{z}) \tag{19}$$

$$I_u = I_u \underset{(-)}{(e} , \underset{(-)}{\frac{E_b}{E_0(1+t_m+t_{QR})}} ; \underset{(+)}{v}).(\frac{m}{q} + F) \tag{20}$$

where $e = \frac{E_o}{p}$. Equation (19) specifies unreported exports to depend positively on the official RER, e, which signals for allocation between broad tradeables and nontradeables. X_u is also positively influenced by the level of black market rate relative to the tax adjusted official rate. The parameter, z, the share of exports required to be surrendered and transacted through the official market will have a negative effect on X_u. The determinants of I_u also have similar interpretations, e discourages excessive importing in general, $\frac{E_b}{E_0(1+t_m+t_{QR})}$ reflects an arbitrage conditions between the premium and the tax rate on imports inclusive of the implicit tax due to QRs. The shift parameter, v, (the share of imports allowed through the

official market), reflects trade liberalization. Finally I_u is proportional to real wealth $(\frac{m}{q} + F)$ where nominal financial wealth is deflated by E_b, the marginal price of imports.

From (19) and (20), we can write the following unreported current account balance:

$$\dot{F} = X_u\left(e, \frac{q}{1-t_x}; z\right) - I_u\left(e, \frac{q}{1+t_m+t_{QR}}; v\right) \cdot \left(\frac{m}{q} + F\right) \qquad (21)$$

$$(+)\ (+)\ (-) \qquad (-)\ \ (-)\ \ (+)$$

By imposing equilibrium in the unreported current account balance ($\dot{F}=0$), we can write the following linear logarithmic function:

$$\log F_t^* = c_0 + c_1 \log q_t + c_2 \log e_t - c_3 \log (1-t_x) - c_4 \log (1 + t_m + t_{QR}) - c_5 \log m_t - c_6 H(z_t, v_t) \qquad (22)$$

where $H(z,v)$ reflects the effect of commercial policy. Now using (15) - (17), and (22) yields the following reduced form dynamic equation for the premium:

$$\begin{aligned} \log q_t - \lambda \log q_{t+1} = {} & \delta_0 + \delta_1 \hat{E}^e_{0_{t+1}} + \delta_2 \log m_t \\ & - \delta_3 \log e_t + \delta_4 \log (1-t_x)_t \\ & + \delta_5 \log (1+t_m + t_{QR})_t \\ & + \delta_6 H(z_t, v_t) \end{aligned} \qquad (23)$$

where $\lambda = a_1/(1+a_1+c_1) < 1$, and where the δ's are the corresponding coefficients in the RHS. Solution of the above equation for $\log q_t$ requires the knowledge of $\hat{E}^e_{0_{t+1}}$, the expected official exchange rate devaluation at time t + 1 given information at the time t. The above equation suggests the

following forecast equation:

$$\log E_{0_{t+1}} = b_{00} + b_{01}\log E_{0_t} + \sum_{i=0}^{r_1} b_{1i} \log (RER_b/RER_0)_{t-i}$$

$$+ \sum_{i=0}^{r_2} b_{2i}\Delta\log E_{0_{t-i}} + \sum_{i=0}^{r_3} b_{3i} \Delta\log m2_{t-i}$$

$$+ \epsilon_{t+1} \qquad \text{(A.23)}$$

On the other hand the equation (A.23) may be justified on the assumption that agents in the economy know the government reaction function; and that they form their expectations according to this reaction function, in addition to the record of previous devaluations, and the history of monetary emission. Where the third term in the RHS of the equation is the policy reaction function which is based on comparing previous periods black market real exchange rate to the official real rate. If the later was overvalued (smaller) relative to the former there will be a pressure on the authorities to devalue, given their ultimate objective to unify the two rates. The real rates are defined as:

$RER_b = E_b P^*/p$ and $RER_0 = \dfrac{E_0 P^*}{p}$, hence the reaction function can also be interpreted as governed by the level of the premium in past periods,

$m_2 = \dfrac{M_2}{E_0}$ as before is the real stock of broad money, and ϵ is a stationary disturbance term.

Now going back to equation (23) define

the vector [illegible]

of [illegible]

$\log (1-t_x)_t$, $\log (1 + t_m + t_{QR_t})$, $H (z_t, v_t))'$, and obtain the following expression for the steady state level of the premium for a given stationary set of the fundamentals, $\overset{*}{F}$:

$$\log q_t^* = \sum_{j=0}^{\infty} \lambda^j \delta_t' F_{t+j}^* \tag{24}$$

which leads to the following expression:

$$\log q_t^* - \frac{1}{1-\lambda} \delta' F_t^* = \sum_{j=1}^{\infty} \frac{\lambda^j}{1-\lambda} \delta_t' \Delta F_{t+j}^* \tag{25}$$

If q_t and F_t are first difference stationary, then the RHS of (25) is I(0) and the LHS of the equation defines a cointegration relationship with cointegrating vector $\frac{1}{1-\lambda} \delta$. The appendix table (A.1) report the Dickey-Fuller tests for cointegration. According to the results of the tests, we found the variables to be cointegrated. This test also supports the no bubble solution of (25) as well, see Kaminsky (1988). The implications of the cointegration for the premium determination, is that at the weekly and daily Levels; the premium may be influenced by seasonality and other bubbles but at the quarterly and annual levels it were the economic fundamentals that determine the foreign exchange premium.

The long-run cointegrating relationship of equation (25) gives rise to an error-correction specification of form (Engle and Granger (1987)):

$$\Delta \log q_{t+1} = d_0\left(\frac{1}{1-\lambda}\,\delta' F_t - \log q_t\right) + \sum_{i=0}^{R_1} d_{1_i}\,\Delta F_{t+1-i} + \sum_{i=0}^{R_2} d_{2_i}\,\Delta \log q_{t-i} + d_3(B)\,\epsilon_t \qquad (26)^{23}$$

where ϵ_t is white noise process and $d_3(B)$ is a finite polynomial in the lag operator B. While the cointegrating equation gives the long run (or stationary) equilibrium determination of the premium, the error-correction in (26) provides the short-run dynamic specification which is compatible with the long run equilibrium relationship.

1. Estimation and Interpretation of the Model

Using Sudanese quarterly data from 1970, Q1 to 1989, Q4, I estimated equations (A.23), (25), and (26) above. The estimate of equation (A.23) (see equation (A.23') of appendix III) was used to construct the series for expected future devaluation. The other two equations were then estimated sequentially and reported below in (27) and (28).

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[23] In fact strict application of the cointegration model of equations (24) and (25) yields an error-correction equation with only the error-correction term $\left(\frac{1}{1-\lambda}\,\delta' F_t - \log q_t\right)$ in the RHS of equation (26). The general representation of $\Delta \log q_{t+1}$ in equation (26), therefore, provides a test of this strict interpretation of the model. By including lagged dependent variables, the above specification also accounts for the existence of important MA components in the disturbance term process.

$$\log q_t = \underset{(9.66)}{0.10} \log m_t \underset{(-1.68)}{-0.17} \log e_t + \underset{(3.87)}{0.30} \hat{E}^{\bullet}_{0_{t+1}}$$

$$\underset{(-1.76)}{-0.05} \text{ DUM (79Q3-81Q2)} \quad \underset{(-4.10)}{-0.13} \text{ DUM (81Q3-83Q1)}$$

$$\underset{(-2.91)}{-0.12} \text{ DUM (83Q2-83Q4)} \quad \underset{(3.69)}{+0.08} \text{ DUM (85Q1-89Q2)}$$

$R^2 = 0.52, \quad \bar{R}^2 = 47, \quad DW = 1.21$ (27)

$$\Delta \log q_{t+1} = \underset{(4.19)}{0.47} \left(\frac{1}{1-\hat{\lambda}} \delta^1 F_t - \log q_t \right)$$

$$+ \underset{(4.60)}{0.60} \Delta \log m_{t+1} + \underset{(6.09)}{0.33} \Delta \hat{E}^{\bullet}_{0_{t+1}}$$

$$- \underset{(-1.80)}{0.18} \Delta \log e_t + \underset{(2.10)}{3.87} \log (1-t_x)_t$$

$$+ \underset{(1.60)}{0.58} \log (1 + t_m + t_{QR})_t$$

$$- \underset{(-3.19)}{0.25} \Delta \log q_{t-2} - \underset{(-2.26)}{0.18} \Delta \log q_{t-3}$$

$R^2 = 0.68, \quad \bar{R}^2 = 0.65, \quad DW = 1.98$ (28)

t - statistics are in parenthesis. With regard to the first equation, even though the tax policy terms appear to be non-stationary (Table (A.2)), they were not found to be significant and the model is still cointegrated when I dropped them out. The tax policy effect is found to be significant and

consistent with the model predictions, however, in the error-correction equation. [24]

First, let me consider the error-correction equation in (28), which gives the short-run dynamic aspects of the premium determination. In this equation the dynamic behavior is reflected by the error-correction term and its positive (but less than one) and significant coefficient. If the fundamentals in the previous period calls for a higher premium than the observed ie. $\frac{1}{1-\lambda}\delta' F_t - \log q_t > 0$; then since the coefficient is positive, the level of the premium in the following period will increase. The results also show substantial and significant short run influences for changes in expectation of future devaluations and in the stock of money. As predicted by the model, a higher tax on exports[25] reduces the premium in the short-run, while a higher import tax causes the premium to rise. Real depreciation on the other hand, has a negative short-run effect on the premium. Finally, changes in the premium are shown to display lag structure extending up to the fourth quarter. Now turning to the long run specification results of equation (27), we start with the effects of commercial policy and other policy-related regime shifts. The commercial policy term H (z,v) which accounts for the effect of trade liberalization is represented by DUM (79Q3-81Q2) and DUM (81Q3-83Q1), while policy reversals are represented by the other two dummies. As we mentioned earlier, trade liberalization in Sudan, has been

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[24] This may be explained by the fact that the data for tx, tm, and t_ψ were originally obtained from Elbadawi (1987, 89) in annual form and then quarteralized for the purpose of the above regressions.

[25] A priori the export tax effect could go either way, since it may also reduce the overall level of exports and hence the portion that goes into smuggling.

one of successive transfer of imports to the free market where imports are financed by 'own resources' obtained through the black 'free' market; for export however, it has generally been slow and largely confined to marginal exports.

This effect of such trade policy which will be to exert an upward pressure on the stationary level of the premium should be balanced with other aspects of trade liberalization that may lead to enhanced flow of remittances and imports and hence less scarcity rents on the latter. This second effect should cause the premium to decline. The negative coefficients for the first two dummies of equation (27) above, show that the net effect of trade-liberalization has been a reduction on the long-run level of the premium. DUM(83Q2-8344) represents a period of a brief suspension between the two liberalization periods 1981Q3-1983Q1 and 1984Q1-1985Q1 during which the black market was fully legalized (see Table (1)). As the results show, this brief suspension measure was correctly anticipated by agents in the economy to be temporary and therefore it did not alter the negative influence of liberalization on the premium. After February 1985, however, when the authorities began to slow down the liberalization drive, and then started drifting towards more tightened levels of exchange controls; the long-term level of the premium experienced a rise as reflected by the coefficient of DUM (85Q1-89Q2).

The other long run determinant that reflects the current account condition is the official real exchange rate which has an elasticity of -0.17. This effect shows the importance of official real exchange rate overvaluation in explaining the persistence of the high premium in Sudan. So what is needed to bring down the level of the premium in the long run is more than just a

nominal devaluation, rather it is the effectiveness or the efficiency of that devaluation. The long run effect of real wealth as reflected by the coefficient of $\log m$ in equation (27) is slightly smaller at 0.10 but much more significant, however.

The long run influences of the asset market provide for some interesting interpretations with regard to the role of the steady state fiscal deficit, g-t, and the rate of official depreciation π in the determination of the stationary level of the premium. At the steady state, we have

$\hat{E}^{e}_{0_{t+1}} = \pi^{e}$, and $m^{*} = g-t/\pi^{e}$; hence the implied impact effect of the fiscal deficit (g-t) on the steady state level of the premium is low at 0.10 (similar to that of real wealth). Once we allow for the feedback of the rise on the fiscal deficit on π^{e} (appendix equation (A.23')), however, the cumulative elasticity of the premium with respect to the fiscal deficit can be quite high (about 300%).[26] Therefore a reduction in the rate of growth of the fiscal deficit for a given rate of crawl by say 5 percent for example, will lead to a 15 percent reduction in the level of the premium.

Also from equation (27) we can solve for the elasticity of the relative asset demand for domestic money with respect to π^{e}, which is equal to about $-3.0\pi^{e}$. This allows us to derive the threshold level of expected depreciation (π^{e} = 33 percent) that is consistent with a negative unitary elasticity. A stationary rate of crawl or expected rate of devaluation in excess of 33

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[26] This elasticity is obtained by substituting for $\hat{E}^{e}_{0_{t+1}} = \log E_{0_{t+1}} - \log E_{0_{t}}$ from the appendix equation (A.23') in equation (27) and solving for the cumulative effect of (g-t) on q as: $[0.10+(0.30)(0.83)]/[1-(0.30)(1.25+0.52+0.41+0.76)] = 2.92$.

percent runs the risk of leading to higher premium for a given level of fiscal deficit and commercial policy. Figure (4) depicts annual price inflation and the annualized derived threshold level ($\pi^* = 37$). As can be seen from the graph, the tendancy of inflation to overshoot the threshold for a continuum of extended period (since 1984) confirms the stylized fact of the existence of significant flight from domestic money[27] in Sudan.

This graph could be useful in the interpretation of the observed increasing difficulty at generating seigniorage revenue as shown by the aggregate indicators of table (10). This interpretation will provide an explanation to the opportunities for and the limits to, the trade-off between the premium as an implicit tax on exporters and the inflation tax; that have actually existed during the period considered. Starting with the evidence on table (10), we note that seigniorage[28] revenue as a ratio to GDP increased from 2.8 percent in 1974-77 to 5.4 percent in 1978-87, while the fiscal deficit increased from 5.8 percent to GDP to a staggering 12.9 percent between the two periods. The premium however, remained fairly stable at about 178 percent during each of the two periods. This obviously suggest some sort of a trade-off as well as a relative ease in raising revenue from the inflation tax, during the two period. On the other hand the opposite happened for the last two years 1988-89. The seigniorage revenue declined to only 3 percent of GDP while the fiscal deficit only slightly increased (from 12.9 to 15.9 percent), yet the premium soared to above 300 percent. This evidence seems to

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[27] This means that the premium must be higher for the given stock of domestic money to be willingly held.

[28] Strictly speaking, seigniorage revenue is not in general equal to the revenue from the inflation tax (except when $\dot{m}=0$).

be fairly consistent with the predictions of the graph in terms of domestic inflation. During the 1978-86 period the average level of inflation was less than the threshold. Therefore it appears that there were potential for trade-off between the two implicit forms of taxation during this period. On the other hand, for the 1987-90 period actual domestic inflation averaged about 40 percent; hence the model prediction of both rising premium and declining revenues from inflation, which was ratified by the above evidence.

VI. SOME CONCLUDING REMARKS AND IMPLICATIONS FOR FUTURE ECONOMIC REFORM

In the previous sections of this paper I have studied the macroeconomics of multiple exchange rates and black market for foreign exchange in Sudan. The objectives of the study were laid out in the introduction to this paper; which were to understand the motive(s) and cause(s) that gave rise to the above system, the determinants of the black market premium -both the short run asset market determinants and the longer run trade oriented influences, and finally the extent to which the presence of such black market might have interfered with macroeconomic management of the economy and the lessons that can be drawn for the design of future policy.

The analysis of section II (and appendix I) identifies the achievement of a significant increase in the flow of the enormous remittances of Sudanese nationals working abroad through the 'legal' channels, as the main objective of the program. In the short run the enhanced foreign exchange resources can be allocated more efficiently in order to finance much needed imports and other transactions, whilst at the same time the exchange rate policy can help promote exports and curb the effective demand for imports. The central policies deployed as part of the post September 1979 economic reform programs and designed to achieve this goal among others, were based on discrete maxi devaluations of the exchange rate and gradual trade liberalization reforms with an eye on achieving exchange rate unification and the ultimate integration of the black market into the regular economy.

To analyze the reasons behind the failure of the above economic reform, I studied the determinants of the black market premium using a model that accounts for both portfolio and flow considerations as well as the parameters of official foreign trade policy. A linearized version of this model

emphasizing the role of expectation and the distinction of the long run flow and asset determinants of the premium from the short run dynamic influences, was estimated as well.

Real exchange rate depreciation was found to have a significant negative effect on the premium both in the short run and in the long run. This finding points to the key role real depreciation can play in improving current account balances and consequently in raising the stock of foreign money held by both the official and the private sectors. Expectations of future devaluations were predicted by the model to have a strong and significant positive effect on the premium, this result also shows that there has been considerable flight from domestic money. By invoking the direct link assumed in the model between real fiscal deficit and monetary emission, the fiscal deficit will have a direct positive impact effect on the stationary level of the premium. When its indirect effect through expectations is considered as well, the fiscal deficit influence on the premium can be quite substantial. Finally the effect of trade liberalization - proxied by a dummy variable - was negative and significant. The rather asymmetric nature of this policy - which emphasized liberalization of the import side compared to export - should exert an upward pressure on the premium, but seems to be more than outweighed by the effects of the policy on imported goods availability and on the supply of remittances, which work in the opposite direction.

Therefore, the main conclusion that came out of this analysis is that the lack of strong commitment to fiscal retrenchment has been the main cause behind the failure of economic reform in the Sudan. Because the steady state level of the premium in the black market for foreign exchange depends critically on the size of the fiscal deficit, a devaluation policy by itself

will not reduce the premium in the long run unless preceded or accompanied by a serious fiscal adjustment. Furthermore when a large fiscal deficit persists and credibility is low aggressive devaluation and trade liberalization policy aimed at exchange rate unification and integration of the black market, will run the risk of leading to speculation of further devaluations, large scale currency substitution and a rising premium.

According to the analysis of Section (IV.1) of this paper, a rising premium is shown to have negative impacts on official exports and foreign trade taxes, as well as a positive effect on capital flight. Therefore, a rising premium and expanding black market could have serious fiscal and commercial policy implications by squeezing the tax base in foreign trade transactions and by expanding the opportunities for large scale rent seeking activities. A high premium also aggravates the debt problem and the foreign exchange constraint through its effects on capital flight and the recorded current account balance.

The above analytical framework and its corresponding policy implications is typical of this literature (e.g. Pinto op.cit.), and the evidence is also not limited to the Sudan; other experiences of failed stabilization efforts in Africa such as the ones of Sierra Leone and Zambia can be cited. The novelty of the analysis of this paper, however, is that the primacy of the fiscal policy both in terms of sequencing and magnitude, derives not only from its influence on the stationary level of the premium; but equally, if not importantly, from the key role played by the fiscal deficit in influencing expectation of future devaluation. Furthermore, when the fiscal problem is not adequately addressed, the resulting high expectations of future devaluations may lead to a rising premium and declining revenue from the inflation tax

regardless of the exchange rate policy pursued. Therefore, under conditions of large fiscal deficits and low credibility, an exchange rate policy of accelerated crawl is only necessary (but not sufficient) for generating unsustainable post unification inflation or policy reversal. This finding substantially strengthens the case for effecting structural reform aimed at the fiscal sector at an early stage of the stabilization program.

1. Implications for Future Economic Reform in the Sudan

We emerge from the above discussion with the conclusion that for an economy with a sizable parallel market and a large foreign economic enclave in the form of nationals working abroad such as Sudan; successful stabilization based on exchange rate and trade reform do not only require accompanying or preceding fiscal reform, but the fiscal program may have to be credible enough to be perceived as the major and most enduring component of the reform package. Also a trade reform that is biased towards liberalization of imports vis-a-vis exports is likely to exert upward pressures on the premium for any given level of the fiscal deficit or rate of official exchange rate depreciation. In the case of Sudanese stabilization this policy not only contributed to the failure of unification but also provided for a biased structure of incentives against agriculture and in favor of services and nontradeables, Elbadawi (1989).

The widely shared professional view in Sudan and in the international community is that economic reform in Sudan should start with strong and deep stabilization program aimed at reducing the more than 80 percent level of inflation. This stabilization effort which must be made at the early stages of the program must be followed by reforms in the areas of the tax system,

expenditure structure, and cost recovery; and deregulation and parastatal reform. The final stage of the program should be geared to the longer run development issues such as rehabilitation and expansion of education and health services, agricultural research and infrastructure, and the environment. The findings of this paper -summarized in the above conclusion- can contribute to the design and sequencing of the above broadly based program especially with regard to the stabilization phase.

It is also the consensus view that even with a serious and successful reform program economic recovery in Sudan will require substantial debt relief.[29] Given the right policies however, Sudan can count on the substantial saving of her nationals working abroad to finance economic growth and to help pay her foreign debt. According to some recent World Bank estimates, if most or all potential savings were sent to Sudan, the saving from remittances is estimated (conservatively) to account for 6 percent of GDP and could go as high as 24 percent of GDP. If we also consider the potential for luring back the savings that went out as capital flight, the remittances can play a key role in financing economic growth in Sudan. Notwithstanding the still serious debt problem; the main problem of Sudan with regard to the finance of investment and long term growth, will then become a problem of designing appropriate policies to attract these remittances through the official or legal channels rather than the shortage of foreign exchange or the paucity of domestic saving.

The experience of the past few years in Sudan tells us that under conditions of real overvaluation, policies aimed at achieving the above

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[29]The World Bank estimated that by June 1990, Sudan's stock of foreign debt will account for 1500 percent of exports and 110 percent of GDP.

objective through regulating the flow of the remittances, or introducing 'incentive gimmicks' such as subsidized land sale or special import privileges to expatriate workers in return for sending their foreign exchange through the official channels, were extremely ineffective. Subscribing to the analysis of this paper, I think a credible exchange rate and trade reform supported with consistent macroeconomic policy is critical for the realization of the full potential from these remittances. Even when the program was not judged to be credible enough, "the potency of the exchange rate and trade policies in attracting remittances, at least through the official channel, was amply demonstrated between August 1987 and June 1989, when Sudanese were allowed to use the parallel market exchange rate for 'own- resource' imports. Over US$ 1.2 billion worth of 'own-resource' financed licenses were franked by the Bank of Sudan during this period," a recent World Bank document. Therefore in addition to other reforms in key areas such as the financial system and investment policy, the foreign trade and exchange rate stabilization program will play an equally important role in effecting the much needed transition from adjustment to growth.

TABLE 1: EXCHANGE RATE MARKET IN THE SUDAN

PERIOD	OFFICIAL EXCHANGE RATE	REGULATED PARALLEL RATE	RATE FOR WORKER REMITTANCES	FREE MARKET RATE	ILLEGAL MARKET RATE/PICKS
1. EXCHANGE CONTROL (1955 - AUG 1979)					
1955 - MAY 78	0.35	-	-	-	-
1972	0.35	0.40	-	-	0.61
JULY 1973	0.35	0.40	0.45	-	0.61
JAN 1974	0.35	0.40	0.56	-	0.60
JULY 1976	0.40	0.40	0.57	-	0.55
MARCH 1979	0.40	0.40	0.67	-	0.67
2. INITIAL LIBERALIZATION ATTEMPT (SEPT 1979 - JUNE 1981)					
SEPT 1979	0.50	0.80	-	-	1.00
SEPT 1980	0.50	0.80	-	-	1.10
JUNE 1981	0.50	0.80	-	-	0.90
3. LEGALIZED FREE MARKET (JUL 1981 - APR 1983 : JAN 1984 - JAN 1985)					
a. JULY 1983 - APRIL 1983					
JULY 1981	0.50	0.80	-	1.08	0.94
NOV 1981	0.90	-	-	1.10	1.25
JUNE 1982	0.90	-	-	1.13	1.41
AUG 1982	1.30	-	-	1.75	1.43
NOV 1982	1.30	-	-	1.75	2.17
FEB 1983	1.30	1.75	-	1.85	1.69
MAR 1983	1.30	1.75	-	-	1.75
b. MAY 1983 - DEC 1983 (BRIEF SUSPENSION)					
MAY 1983	1.30	1.75	-	-	1.72
JUNE 1983	1.30	1.80	-	-	1.75
DEC 1938	1.30	1.80	-	-	2.00
c. JAN 1984 - JAN 1985					
JAN 1984	1.30	1.80	-	-	2.04
JUNE 1984	1.30	1.80	-	2.00	2.63
OCT 1984	1.30	2.10	-	-	2.50
JAN 1985	1.30	2.10	-	3.60	3.03
4. QUASI-LEGALIZED FREE MARKET (FEB. 1985 - JUNE 1989)					
FEB 1985	2.50	3.30	-	-	4.35
MAR 1986	2.50	4.00	-	-	7.69
APR 1987	2.50	4.00	-	-	6.25
OCT 1987	4.50	4.50	-	-	7.69
OCT 1988	4.50	11.30	-	-	14.29
JUNE 1989	4.50	12.10	-	-	25.00
5. POLICY REVERSALS (JULY 1989 - PRESENT)					
JULY 1989	4.50	12.10	-	-	16.67
SEPT 1989	4.50	12.10	-	-	12.50
DEC 1989	4.50	12.10	-	-	20.00
FEB 1990	4.50	12.10	-	-	33.33
DEC 1990	4.50	12.10	-	-	50.00

TABLE 2: REMITTANCES BY NATIONALS WORKING ABROAD

YEAR	OFFICIAL REMITs.	TOTAL REMITs.	OFF.REMIT/ EXPORTS(%)	OFF. REMIT/ IMPORTS(%)	OFF.REMIT/ GDP(%)
1973/74	24.40	107.49	5.09	3.94	0.79
1974/75	66.10	291.19	12.55	6.47	1.67
1975/76	150.70	663.88	[illegible]5	12.90	3.12
1976/77	172.00	757.71	24.[illegible]4	15.17	2.86
1977/78	221.00	973.57	31.75	16.25	3.08
1978/79	240.00	1057.27	34.32	18.16	3.15
1979/80	209.00	920.70	25.80	13.09	2.69
1980/81	305.00	1343.61	40.78	16.95	3.62
1981/82	350.00	1541.85	52.47	17.38	4.29
1982/83	415.00	1828.19	50.54	23.00	5.62
1983/84	395.00	1740.09	41.92	24.08	4.80
1984/85	430.00	1894.27	53.72	30.84	5.46
1985/86	350.00	1541.85	49.83	26.16	4.40
1986/87	250.00	1101.32	35.63	22.08	2.61
1987/88	445.00	1960.35	67.85	30.66	4.71
1988/89	294.00	1295.15	40.26	19.74	2.32

NOTES:

Official and total remittances in million US$.
Figures for 1987/88 and 1988/89 are preliminary estimates.

The data on official remittances are obtained from various World Bank and Bank of Sudan reports.

Total remittances are calculated from official remittances, based on evidence from migrant household surveys which gives an average ratio of official tottotal remittances of around 23%.

TABLE 3: THE IMPORT REGIME IN THE SUDAN

YEAR	TOTAL IMPORTS	SELF-FINANCED IMPORTS	NON-OFFICIAL REMITTANCES	SFI/N-O R(%)	SFI/TOTM (%)
PRE SEPTEMBER 1979					
1972/73	375.40	51.09	16.69	306.16	13.61
1973/74	469.53	83.80	83.09	100.86	17.85
1974/75	505.98	57.69	225.09	25.63	11.40
1975/76	598.40	42.19	513.18	8.22	7.05
1976/77	767.44	102.75	585.71	17.54	13.39
POST SEPTEMBER 1979					
1981/82	2014.00	809.80	1191.85	67.94	40.21
1982/83	1804.00	920.70	1413.19	65.15	51.04
1983/84	1640.40	1031.70	1345.09	76.70	62.89
1984/85	1394.50	1080.80	1464.27	73.81	77.50
1985/86	1338.10	-	1191.85	-	-
1986/87	1132.30	-	851.32	-	-
1987/88	1451.20	594.70	1515.35	39.25	40.98
1988/89	1489.30	627.00	1001.15	62.63	42.10

NOTES: Figures in millions of US$ except
SFI/N-O R = Self-financed Imports / Non-official Remittances and
SFI/TOTM = Self-financed Imports / Total Imports
which are expressed as percentages

TABLE 4: CAPITAL FLIGHT

YEAR	CAP.FLT (million US$)	CAP.FLT/ NET DEBT INFLOW(%)	CAP.FLT/ GDP(%)
1973	154.47	203.25	6.00
1974	743.30	176.60	20.77
1975	922.52	237.95	21.26
1976	954.96	237.20	17.99
1977	265.10	84.56	3.95
1978	513.40	115.40	6.72
1979	805.90	131.75	10.63
1980	903.63	137.43	11.38
1981	900.83	157.43	10.11
1982	1469.96	166.72	19.88
1983	661.20	151.23	8.96
1984	409.77	170.31	4.51
1985	1106.75	1305.13	16.60
1986	528.92	901.06	5.45
1987	1039.05	651.04	9.06
1988	532.25	164.38	5.45

NOTES:

Definition of capital flight is in Appendix 2.
Net Debt Inflow: Disbursments less amortization and interest payments
Includes new debt only

SOURCE: IFS, ANDREX, WORLD DEBT TABLES

TABLE 5: BASIC STATISTICS FOR THE BLACK MARKET PREMIUM (monthly data)

PERIOD	1 JAN 1970- AUG 1979	2 SEP 1979- JUN 1981	3 JUL 1981- APR 1983	4 MAY 1983- DEC 1983	5 JAN 1984- JAN 1985	6 FEB 1985- JUN 1989	7 JUL 1989- NOV 1990
MEAN	1.74	1.88	1.52	1.45	1.93	2.46	7.69
STANDARD DEVIATION	0.20	0.22	0.24	0.08	0.17	0.96	3.56
COEFFICIENT OF VARIATION	0.11	0.12	0.16	0.06	0.09	0.39	0.46
MEDIAN	1.72	1.93	1.56	1.49	1.93	2.15	8.89
MAXIMUM VALUE	2.45	2.26	1.96	1.54	2.33	5.56	11.11
MINIMUM VALUE	1.37	1.60	1.03	1.37	1.57	1.21	2.78

TABLE 6: BASIC STATISTICS FOR THE BLACK MARKET EXCHANGE RATE (monthly data)

PERIOD	1 JAN 1970- AUG 1979	2 SEP 1979- JUN 1981	3 JUL 1981- APR 1983	4 MAY 1983- DEC 1983	5 JAN 1984- JAN 1985	6 FEB 1985- JUN 1989	7 JUL 1989- NOV 1990
MEAN	0.62	0.94	1.39	1.88	2.51	8.51	34.62
STANDARD DEVIATION	0.20	0.07	0.12	0.35	0.12	5.24	16.01
COEFFICIENT OF VARIATION	0.11	0.12	0.25	0.06	0.09	0.61	0.46
MEDIAN	0.68	0.97	1.39	1.94	2.50	10.63	40.00
MAXIMUM VALUE	0.85	1.12	2.17	2.00	3.03	25.00	50.00
MINIMUM VALUE	0.48	0.80	0.89	1.72	2.04	3.03	12.50

TABLE 7: STATIONARITY, SKEWNESS AND KURTOSIS COEFICIENTS FOR THE BLACK MARKET EXCHANGE RATE

PERIOD	QUARTERLY (1970-89)	MONTHLY (1970-89)	WEEKLY (1970-85)	DAILY (01/84-02/85)
A) LEVEL LOG Eb				
KURTOSIS COEFFICIENT	5.69 (0.41E-22)	6.33 (0.14E-85)	1.21 (0.2E-03)	4.20 (0.61E-31)
SKEWNESS COEFFICIENT	2.43 (0.37E-17)	2.52 (0.17E-55)	0.95 (0.51E-08)	1.96 (0.14E-27)
DICKEY-FULLER	0.91	0.77	2.56	0.55
AUG. DICKEY-FULLER (4)	2.76	1.50	1.90	3.97
B) CHANGE IN LOG Eb				
KURTOSIS COEFFICIENT	3.07 (0.99E-07)	3.34 (0.25E-24)	12.00 (0.19E-293)	12.61 (0.26E-270)
SKEWNESS COEFFICIENT	0.74 (0.86E-02)	0.29 (0.015)	1.29 (0.20E-14)	0.90 (0.34E-06)
DICKEY-FULLER	-10.42	-17.60	-10.00	-11.06
AUG. DICKEY-FULLER (4)	-3.60	-7.88	-3.89	-2.05

Notes: Figures in parentheses are marginal significance levels

Source: Basic data obtained from USAID (1985)

TABLE 8: SELECTED MONTHLY DATA ON EXCHANGE RATES
(for the month of devaluation and the two months preceding and following)

	YEAR			DEVALUATI (OER)	DEPRECIATION (BER)	PREMIUM	% CHANGE PREMIUM	DOMESTIC INFLATION	% CHANGE CREDIT	CHANGE IN RESERVES (US$ MIL)
	1978	M	4	0.00	-3.23	1.85	-3.23	6.03	1.68	0.00
	1978	M	5	0.00	6.90	1.98	6.90	6.03	-0.07	3.40
DEV(1)	1978	M	6	14.86	-15.20	1.46	-26.18	7.68	0.83	-6.30
	1978	M	7	0.00	1.79	1.49	1.79	8.96	6.90	8.90
	1978	M	8	0.00	27.27	1.89	27.27	-1.64	2.85	-8.90
	1979	M	7	0.00	4.00	1.43	4.00	9.16	4.40	0.00
	1979	M	8	0.00	0.57	1.44	57.00	2.72	1.84	10.40
DEV (2)	1979	M	9	25.00	74.00	2.00	39.20	3.94	0.67	-19.10
	1979	M	10	0.00	-18.03	1.64	-18.03	1.76	2.22	-8.70
	1979	M	11	0.00	0.83	1.65	0.83	0.06	1.78	60.40
	1981	M	9	0.00	-3.77	1.89	-3.77	-13.04	5.06	-0.20
	1981	M	10	0.00	-5.36	1.79	-5.36	-5.86	1.69	-0.50
DEV (3)	1981	M	11	80.18	4.00	1.39	-22.30	-1.99	-1.88	6.40
	1981	M	12	0.00	25.93	1.03	25.93	-0.78	0.17	-13.50
	1982	M	1	0.00	30.12	1.34	30.12	8.24	3.56	0.60
	1982	M	9	0.00	1.45	1.61	1.45	0.31	3.77	0.10
	1982	M	10	0.00	15.00	1.85	15.00	0.89	0.32	-0.20
DEV (4)	1982	M	11	44.31	30.43	1.67	9.61	-0.60	4.80	-6.90
	1982	M	12	0.00	-6.12	1.57	-6.12	-1.86	-4.20	1.70
	1983	M	1	0.00	-18.33	1.28	-18.33	4.95	0.17	-2.30
	1984	M	12	0.00	2.63	2.02	2.63	2.75	-1.65	0.70
	1985	M	1	0.00	15.15	2.33	15.15	8.96	7.62	-0.30
DEV (5)	1985	M	2	92.30	43.48	1.74	-25.39	3.87	4.81	-6.20
	1985	M	3	0.00	-28.13	1.25	-28.13	5.29	1.88	-0.30
	1985	M	4	0.00	0.00	1.25	0.00	-2.79	-0.49	-0.40
	1987	M	8	0.00	21.43	2.86	21.43	6.63	2.34	-8.50
	1987	M	9	0.00	0.00	2.86	0.00	7.21	0.15	-26.30
DEV (6)	1987	M	10	80.02	7.69	1.71	7.69	-0.41	1.38	-6.20
	1987	M	11	0.00	8.33	1.85	8.33	-4.47	1.29	2.10
	1987	M	12	0.00	0.00	1.85	0.00	-2.18	0.91	-2.20
	1988	AVG		0.00	83.45	2.65	83.45	55.27	2.43	0.02
	1989	AVG		0.00	41.55	3.82	41.55	63.46	4.55	0.32
	1990	AVG		0.00	164.15	10.09	164.15	NA	NA	NA

NOTE: 1988 MONTHLY AVERAGE FOR FOREIGN RESERVES EXCLUDES MAY AND JUNE
ALL FIGURES ARE EXPRESSED AS PERCENTAGES EXCEPT FOREIGN RESERVES
CREDIT IS DOMESTIC CREDIT

TABLE 9: EXCHANGE RATES AND DOMESTIC INFLATION (quarterly averages)

PERIOD	1970-73	1974-77	1978-87	1988-90
OFFICIAL EXCHANGE RATE	0.348	0.348	1.334	4.500
BLACK MARKET EXCHANGE RATE	0.598	0.619	2.179	24.717
BLACK MARKET PREMIUM	1.719	1.778	1.777	5.493
BER DEPRECIATION (%)	1.049	0.530	9.135	21.282
OER DEVALUATION (%)	0.000	0.000	8.417	0.000
DOMESTIC INFLATION (%)	3.289	3.752	6.583	14.842

NOTES: BLACK MARKET PREMIUM = BER/OER
DOMESTIC INFLATION BASED ON CPI

TABLE 10: FISCAL ACCOUNTS AND GOVERNMENT FINANCE

PERIOD		1970-73	1974-77	1978-87	1988-89 (*)
ROG DOM CREDIT		17.90	37.05	28.24	34.18
PUB SEC SHR OF DOM CREDIT (%)	\1	58.19	64.81	64.44	65.96
RES MONEY/GDP (%)	\1	10.09	11.11	20.73	16.91
SEIGNIORAGE CH H/GDP (%)	\1	1.18	2.84	5.36	3.03
PRIMARY BUDGET DEFICIT/GDP (%)	\2	3.43	4.45	8.73	10.53
TOTAL BUDGET DEFICIT/GDP (%)	\2	4.31	5.84	12.96	15.87
TAX REVENUE/GDP (%)		14.61	13.84	12.26	8.12
FGN TAX REV/ TOTAL TAX REV (%)	\2	52.99	59.87	60.21	61.00

NOTES: \1 FOR CALENDAR YEAR
\2 FOR FISCAL YEAR
(*) PRELIMINARY ESTIMATES

SOURCE: IFS DATABASE, VARIOUS BANK REPORTS

TABLE 11: GDP AND ITS COMPONENENTS

PERIOD	1970/71-73/74	1974/75-77/78	1978/79-86/87	1987/88-88/89
RATE OF CHANGE OF REAL GDP	9.30	10.69	0.78	2.75
SHARE OF GROSS INVESTMENT IN GDP	8.80	18.03	14.09	10.57
SHARE OF PUBLIC INVESTMENT IN GROSS INVESTMENT	NA	37.20	35.88	34.18
SHARE OF CONSUMPTION IN GDP	75.79	87.72	98.09	99.28
SHARE OF PUBLIC CONSUMPTION IN TOTAL CONSUMPTION	21.50	14.17	12.13	8.77
SHARE OF GROSS DOMESTIC SAVINGS IN GDP	24.21	1.07	0.11	0.08
SHARE OF GROSS NATIONAL SAVINGS IN GDP	NA	11.14	0.59	-3.46
SHARE OF AGRICULTURE IN GDP	43.90	41.68	35.33	35.00
SHARE OF INDUSTRY IN GDP	13.98	13.68	14.31	15.00
SHARE OF SERVICES IN GDP	42.18	44.68	50.58	50.00

Sources: IFS DATABASE, ANDREX AND VARIOUS BANK REPORTS

TABLE 12: EXTERNAL ACCOUNTS (annual)
(millions of US dollars)

PERIOD	1970-73	1974-77	1978-87	1988-89
MATERIAL BALANCE	36.55	-127.85	-305.20	-521.50
OFFICIAL WORKERS REMITTANCES	7.21	152.45	338.90	294.00
DEBT SERVICE	41.55	109.49	102.70	63.10
CURRENT ACCOUNT BALANCE	28.30	-231.73	-186.22	-322.15
OVERALL BALANCE	23.60	-179.10	-224.38	252.08
CHANGE IN RESERVES	-21.20	31.00	84.48	-49.48

NOTES: FIGURES FOR WORKERS REMITTANCES FOR 1970-72 FROM SWAMY (1981)
REST FROM BANK REPORTS IN FISCAL YEARS
DEBT SERVICE FIGURES FROM VARIOUS BANK REPORTS
ALL OTHERS FROM IFS DATA

TABLE 13: REAL EXCHANGE RATE AND ITS COMPONENTS

PERIOD	1970-73	1974-77	1978-87	1988
TERMS OF TRADE INDEX	165.24	198.33	119.51	NA
AVERAGE EXPORT TAX RATE	0.07	0.10	0.06	0.02
AVERAGE IMPORT TAX RATE	0.44	0.42	0.37	0.25
RATIO OF RESOURCE BALANCE TO GDP (%)	-0.34	-7.89	-9.49	-7.58
MRER1	70.06	73.40	128.21	NA
MRER2	33.23	32.50	225.33	572.84

NOTES: Terms of trade index from Elbadawi (1989)
Average export tax rate = export tax revenues/value of exports
Average import tax rate = import tax revenues/value of imports
Both tax rates are for fiscal years. From various World Bank estimates
MRER1 = Nontradeables price index/Tradeables price index
MRER2 = Nontradeables price index/export price index
Base for all = 1980
Figures for 1988 are preliminary estimates

TABLE 14: FINANCIAL VARIABLES (annual)

PERIOD	1970-73	1974-77	1978-87	1988-89
M1/GDP (%)	15.06	15.78	24.89	15.83
M2/GDP (%)	17.22	18.57	31.94	19.99
NOMINAL INTEREST RATE	NA	NA	9.16	NA
REAL INTEREST RATE	NA	NA	-18.19	NA
WORLD NOMINAL INTEREST RATE	7.47	7.37	10.84	7.98
DEPRECIATION BER (%)	3.94	2.14	38.24	62.50

NOTES: WORLD INTEREST RATE = LIBOR ON 3 MONTH US DOLLAR DEPOSITS
DOMESTIC NOMINAL INTEREST RATE = 3 MONTH DEPOSIT RATE
REAL INTEREST RATE = DOMESTIC NOMINAL RATE - DOMESTIC INFLATION
DOMESTIC INFLATION = % CHANGE IN CPI
FIGURES FOR 1988 ONLY EXCEPT BER DEPRECIATION
GDP FOR 1988 PRELIMARY ESTIMATE

TABLE 15: MARKET PREMIUM AND MACROECONOMIC PERFORMANCE(OLS:1970-88)

	Dependent Variables				
	FTAXP	FTAXY	KFLT	KFLTDEBT	EXPGDP
REGRESSORS					
Constant	1859.76	0.07	..	..	0.28
	(3.15)	(2.33)	..	..	(1.58)
log GDP	62.17	0.002	..	..	..
	(1.03)	(0.63)	..	..	..
Log(Eb/Eo)	-971.20	-0.04	461.26	133.36	-0.16
	(-2.91)	(-2.44)	(1.09)	(3.88)	(-2.77)
log RER	-505.16	0.03	..	..	..
	(1.34)	(1.44)	..	..	..
WIRATE	..	..	..	87.15	5.00
	..	..	..	(3.01)	(1.96)
Px/Pn	..	..	..	..	1.22
	..	..	..	..	(3.25)
GDP/Trend GDP	..	..	..	..	-0.11
	..	..	..	..	(-2.29)
DUM(83-87)	-312.3	-0.01	..	..	..
	(-2.09)	(-1.90)	..	..	..
DUM 85	..	..	..	204.26	..
	..	..	..	(5.50)	..
DUM 87	..	..	1724.80	..	..
	..	..	(4.24)	..	..
DUM 88	..	..	-484.94	..	..
	..	..	(-1.11)	..	..
DUM(73-78)	..	..	..	95.62	..
	..	..	..	(4.74)	..
R squared	0.55	0.55	0.70	0.75	0.84
Adj. R squared	0.45	0.42	0.63	0.69	0.81
Durbin Watson	1.79	2.21	1.40	1.30	1.50

Table 16: VARIANCE RATIO STATISTICS OF k-DIFFERENCES FOR INFLATION IN SUDAN

	1970.1 - 1973.12		1974.1 - 1977.12		1978.1 - 1987.12		1988.1 - 1990.12	
k	stat	std error	stat	std error	stat	std error	stat	std error
1	1.000	0.170	1.000	0.168	1.000	0.106	1.000	0.180
5	0.204	0.08[illegible]	0.285	0.112	0.328	0.079	0.208	0.088
10	0.109	0.06[illegible]	0.165	0.192	0.201	0.070	0.111	0.072
15	0.084	0.066	0.126	0.098	0.122	0.053	0.080	0.069
20	0.045	0.045	0.092	0.089	0.084	0.043	0.061	0.067
25	0.024	0.030	0.052	0.063	0.051	0.030	0.055	0.079
30	0.028	0.043	0.032	0.043	0.055	0.037	0.058	0.111
50	..	..	..	..	0.033	0.032	..	..

Notes: Standard errors are computed according to Bartlett asymptotic procedure.

TABLE (A.1): EXCHANGE RATES IN THE SUDAN

YEAR	OER	BER
1970	0.35	0.67
1971	0.35	0.61
1972	0.35	0.52
1973	0.35	0.59
1974	0.35	0.61
1975	0.35	0.67
1976	0.35	0.60
1977	0.35	0.60
1978	0.39	0.67
1979	0.45	0.74
1980	0.50	0.98
1981	0.60	1.01
1982	1.00	1.54
1983	1.30	1.82
1984	1.30	2.47
1985	2.50	3.53
1986	2.50	6.51
1987	3.00	6.48
1988	4.50	11.91
1989	4.50	17.18
1990	4.50	50.00

Notes: BER - Black market rate
OER - Official rate

Source: IFS AND PICK'S CURRENCY YEARBOOK
OFFICIAL AND BLACK MARKET RATES ARE IN SUDANESE POUNDS/US $

Table (A.2)

COINTEGRATION TEST FOR THE BLACK MARKET EXCHANGE RATE PREMIUM FOR THE SUDAN

(including a time trend)

Variable	DF	ADF[4]	Difference	DF	ADF[4]
Log(q)	-3.09	-0.63	dLog(q)	-9.68	-4.25
Log(m)	-1.95	-1.51	dLog(m)	-9.39	-4.62
Log(1-tx)	-2.1	-1.8	dLog(1-tx)	-8.49	-4.35
Log(1+tm)	-2.54	-2.84	dLog(1+tm)	-8.2	-3.6
Log(e)	-3.2	-1.97	dLog(e)	-10.06	-4.39
Log(Ehat)	-4.02	-2.32	dLog(Ehat)	-9.56	-4.11
Cointegration Residual (w/o tax)	-4.91	-2.96			

Notes:

q = black market rate/official exchange rate

m = broad money/official exchange rate

tx = export tax rate

tm = import tariff

e = real exchange rate (Official Exchange rate * US WPI / Domestic CPI)

Ehat = expected devaluation

Fig 1: BLACK MARKET PREMIUM
IN THE SUDAN

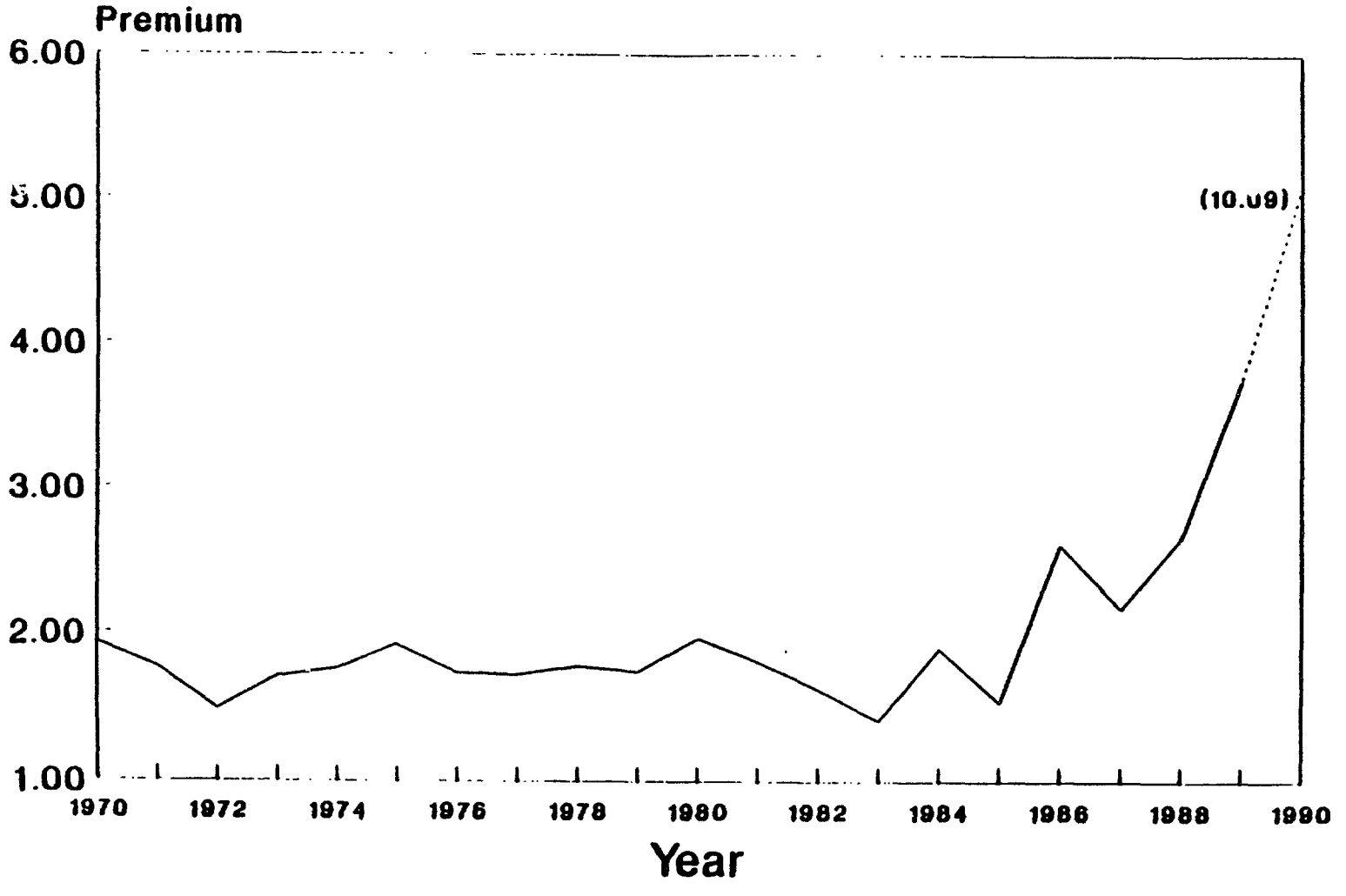


FIG 2: BLACK MARKET EXCHANGE RATE

THE SUDAN (SELECTED DAILY, 11/84-02/85)

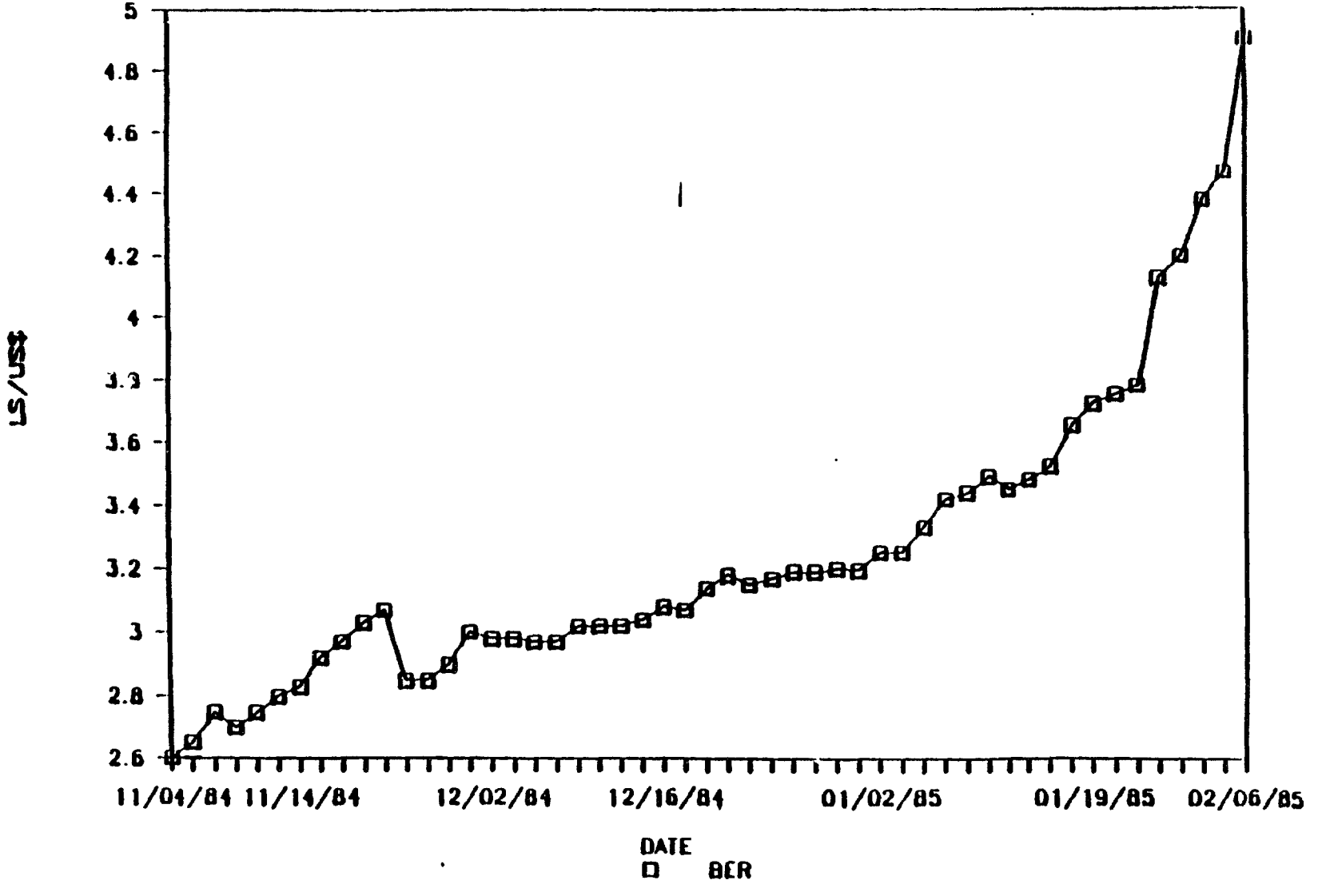
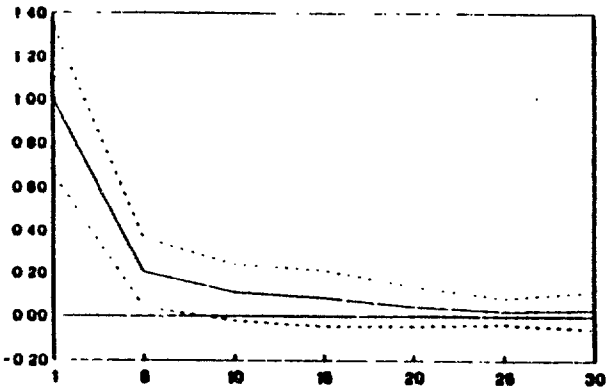
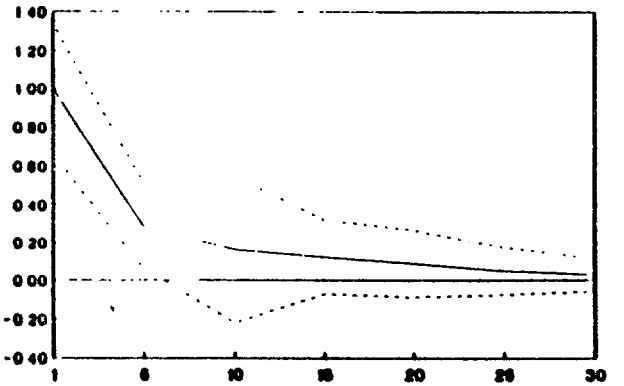


Figure (3)
VARIANCE RATIO STATISTICS OF k-DIFFERNCES FOR INFLATION IN THE SUDAN

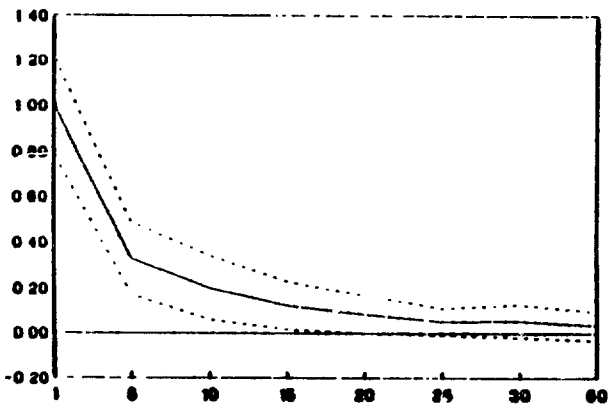
1970-73



1974-77



1978-87



1988-90

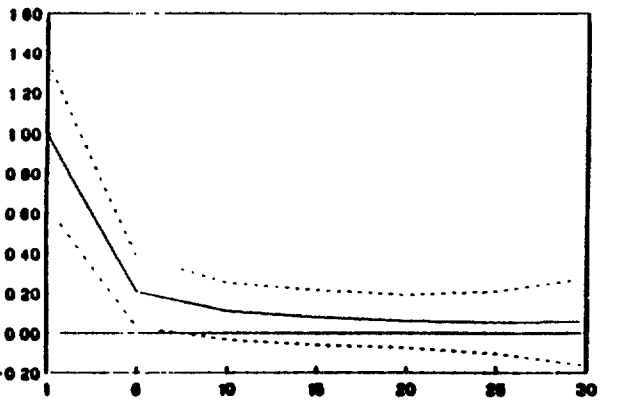
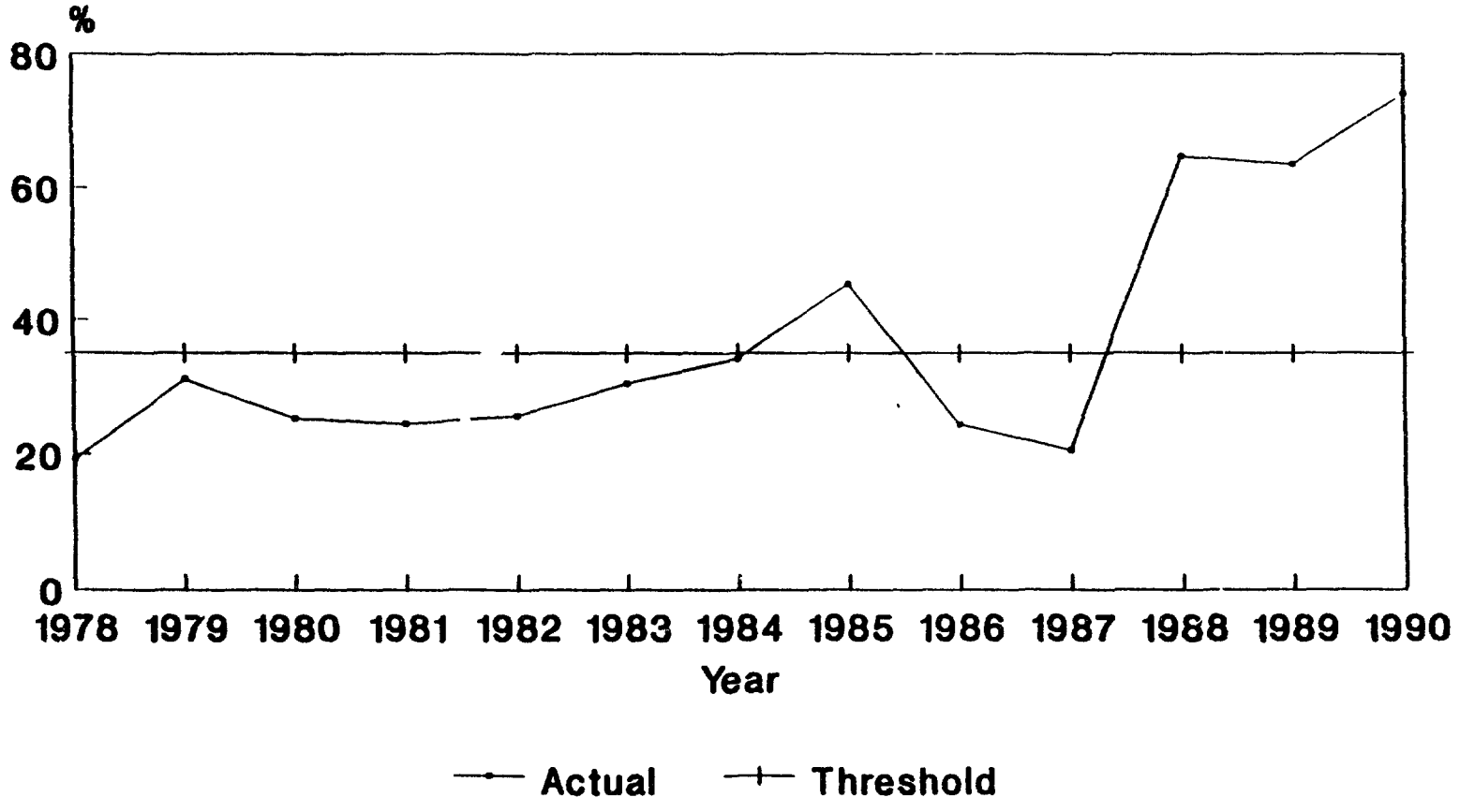


Fig 4: Inflation in Sudan

Actual and Threshold (Annual)



Threshold is weighted by the ratio of M2(Q4) to M2(quarterly, averaged) to annualize the estimation in the text.

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APPENDIXES

APPENDIX I

A RECENT HISTORY OF EXCHANGE RATE AND FOREIGN TRADE POLICIES IN THE SUDAN

Throughout its recent history the Sudan's foreign trade and payment regime has generally been characterized by exchange controls, import restrictions and fixed multiple exchange rates. The import control took various forms such as high tariff rates, tight licencing, or altogether banning of certain categories of imports. This regime has maintained itself and even much of its details since the Sudan's independence in 1956 up to the last year of the seventies decade when the country ushered into a new era of foreign trade and exchange liberalization attempts in September 1979.

Recurrent balance of payment difficulties - despite the controls - and the emerging importance of the remittances from Sudanese national working abroad (SNWA) have prompted the authorities at attempting changes in the above system well before the end of the seventies decade. By the early seventies special import arrangements and more depreciated exchange rate and subsidy schemes were introduced for SNWA remittances and nontraditional exports, while reliance on exchange control and import restrictions continued for the rest of the economy. The seventies have in fact been a transitional period for the Sudanese foreign trade and payment regime with SNWA remittances playing the major role in shaping this transition. The attempts at enhancing the flow of these remittances through the official channels while at the same time segmenting the SNWA sector from the rest of the economy however did not succeed.

The expansive macroeconomic policies adopted during the period have aggravated the already tenuous foreign sector position and facilitated the expansion of the black market which attracted the lion share of SNWA

remittances. Finally the authorities accepted the IMF-inspired stabilization and liberalization package in September 1979. The proposed package was composed of devaluation of the Sudanese pound vis-a-vis the US dollar with an eye on a gradual move towards a complete unification of the exchange rate and elimination of the multiple rate system. On the import side, the policy also calls for a gradual move towards trade liberalization. The quest for liberalization in the Sudan has been a dismal failure. With unsustainable macroeconomic policies, the experiment has widely exposed the credibility problem of the government, thus rekindling expectation and widening the parallel market. After a decade long of liberalization attempts, Sudan now has moved full circle back to total import bans and exchange control enforced by harsh measures including the death penalty.[30]

I.1 The Pre - September 1979 Period

As we mentioned above, the Sudan's import and payment regime started as a strict import against payment system. According to this arrangement all foreign exchange proceeds from exports and invisibles should be surrendered to the Bank of Sudan at the official exchange rate which has been fixed at LS.35 per US dollar. Imports which are classified by type of importers: government, industrial sector and commercial private sector imports; are usually subjected to tight licensing and with the later group of imports being the most affected. As the foreign sector gap worsened during the seventies these controls were more rigorously enforced by the authorities. In view of

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[30]In an attempt to enforce economic controls, especially foreign exchange controls, the current military regime in Sudan which took power in June 30, 1989; have so far executed two alleged violators in addition to others who received harsh jail and other punishments.

the rather inelastic demand for imports in the Sudan (with an estimated import price elasticity of -.40, Elbadawi (1987)) it is not surprising to see increasing reliance on quantitative restrictions of imports as a means to addressing the foreign exchange crisis. The persistence of consecutive deficits in the balance of payments however amply demonstrated the ineffectiveness of the above system. Umbadda (1984) observes that: there were deficits in the BOP for more than 15 consecutive years (with the exception of small surplus of LS 1.6 million is 1969 and LS 9 million in 1973). Since the mid-seventies, the deficits in the BOP developed into a major foreign exchange gap.

1. The Dual Rate System: 1972 - 1979.

By the early seventies the authorities introduced a dual exchange rate system and a new import arrangements as part of a policy designed to tap the foreign exchange resources of SNWA in order to finance much needed imports as well as to encourage export diversification through promotion of marginal exports. The details of such policies are contained in table (1). In 1972 and exchange rate subsidy was established which raised the effective exchange rate applicable to all transactions (except cotton and gum Arabic, two of Sudan's main exports) to LS.40/US$. On May 1975, gum Arabic exports were moved to the effective rate with cotton exports still traded under the lower official rate. In 1978, and as a part of an agreement with the IMF, the official rate was devalued by 13% to rise to LS 0.40/US$. Cotton was therefore transacted at the new depreciated rate of LS 0.40/US$.

In recognition of the increasing importance of (SNWA) in terms of their remittance funds and apparent long-term stability of the flow of these funds,

a premium rate has been set to encourage the transaction of these funds through official banking channels. In July 1973 the premium rate was set at LS 0.45/US$, to be raised to LS 0.56/US$ in January 1974. In July 1977 the premium remained at this level until March 27, 1979, when it rose to LS 0.67/US$.

On the import side two new import systems were introduced: the 'nil-value' and 'town-barter'. This new system, seen as supportive to the still main system of 'import and payments', was designed in such a way so that it may not effect foreign exchange to be officially surrendered. 'Town-barter' which is defended as an export promotion policy is supposed to be financed by 50% of export proceeds of marginal exports while the other 50% is to be surrendered to the authorities at the official exchange rate. The 'nil-value' system on the other hand, were to be financed from the savings of the (SNWA). On the positive side, the 'town-barter' has proven to be an effective export promotion. Also the 'nil-value' has managed to assume an increasing role in financing imports, see table (3). Despite attempts at enforcing the segmentating of this new import and payment system from the main official payment and trade regime, the new system has generated an increased flow demand for foreign exchange.

By the last quarter of the 70's decade, the depreciation in the black market rate started to rise, see table (1). The more depreciated rate in the black market, has in turn helped to accelerate the diversion of SNWA remittances to the black market, and mis-invoicing of exports and imports in the official market. Therefore the unintended effects of the new policy have been to increase the leakage from the official market to the dual market and increased role for the black market for foreign exchange and less SNWA

remittances through the official market.

I.2 Liberalization Attempts 1979-1985

September 1979 marked the beginning of what came to be known as the 'liberalizations era' of the Sudan's foreign trade and payment regime. This liberalization has been a part of a more general economic reform strategy inspired by the IMF and other multilateral agencies.[31] The main objectives of this strategy are to remove price distortions deemed to be biased against exportables and in favor of excessive importing. The proposed package is composed of devaluations and gradual steps towards complete unification of exchange rates. On the trade side the policy also calls for gradual move towards trade liberalization through dismantling of administrative import control measures and giving more chance to tariffs and the newly set 'scarcity' value for foreign exchange to rationalize imports. The central policies adopted by the authorities in this regard were two folds: successive devaluations and continuous shifting of import categories from the official market of foreign exchange to the parallel market. Below we will provide a detailed description of these developments, the major episodes are recorded in table (1) below.

2. Initial Liberalization : Sep. 1979 - June 1981

As we mentioned earlier, July 1978 witnessed the first official devaluation when the currency was devalued by 13 percent. The major shake to the system however, took place in mid September 1979 when foreign exchange

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[31]For more details on IMF stabilization in Sudan, see Ali (1985), Awad (1982), Brown (1986, 1988, 1989), Hussain (1985, 1988), Hussain and Thirwall (1984), and Nashashibi (1980).

controls were abolished and possession of foreign exchange by Sudanese nationals was allowed. Transactions in foreign exchange however, were limited to a group of authorized banks in addition to the Bank of Sudan (BOS). Also the 'nil value' system of the previous period was abolished as it is being dismissed as disruptive and blamed for fueling the rise in the black market premium. Despite the abolishing of the 'nil value' system, dealings in foreign exchange continued. And instead of declining, the black market premium remained high after the devaluation in each of the two official dual rates. Legalizing of foreign exchange possession has the effect of bringing the dealings in foreign exchange from its off-shore markets to inside the country in what come to be known the "street markets".

A dual rate system was created with official rate set at LS .50/US$ and a parallel rate set at LS .80/US$, see table (1). On the trade side all major exports were to be transacted in the official market (94% of all exports), and also some of the more important imports (56%). As the policy of successively moving imports from the official to the parallel market continued only 10 commodities were imported through the official market by September 1980; the list was further shortened in June 1981 when key imports such as pesticides, fertilizers, and all agricultural inputs were transferred to the parallel market. Some key import commodities, however, (wheat, flour, sugar, pharmaceutical, petroleum products, and milk powder) remained in the official market which is now financed by 50% of exports receipts (i.e. commercial banks were asked to surrender this).

On the export side marginal exports were traded in the parallel market since its inception. Moreover complete or partial retention of foreign exchange proceeds from these exports are allowed to be used to finance

imports. Major exports however were moved to the parallel market only after a considerable lag, especially for cotton and gum arabic, two of Sudan's major exports. It took one year since September 1979 before all exports except cotton were transferred to the parallel market, and nearly one more year before cotton was finally transferred.

3. Legalized Free Market: July 1981 - April 1983, Jan 1984 - Jan 1985

The high flow demand for imports and the underlying macroeconomic conditions ensured the continued expansion of the black (free) market of foreign exchange in order to clear both asset and flow transactions while the premium remained high. The persistence of these phenomena despite enforcement efforts by the authorities, paved the way for a major liberalization measures.

By July 1981 the "Black market" was legalized and dealings in foreign exchange was to be conducted in private foreign exchange bureaus (serafas) that are directly supervised by the BOS. Effective November 9th 1981, the official and parallel exchange rate were unified (i.e. devaluation) at LS 0.9 to the US$.

On the import side three quarters of non-cotton exports' proceeds, all cotton proceeds and government imports (petroleum and major food imports), were to be valued at the official unified rate. The remainder of imports are to be valued at the free rate and totally or partially financed by foreign exchange obtained from private exchange houses. This policy led to considerable discretion being accorded to Bank managers in deciding on decisions regarding whether or not to finance imports using banks' resources. Given the extent of excess flow demand for foreign exchange, this arrangement triggered enormous rent-seeking practices, Umbadda (1986). Most of import

demands however still have to be cleared through the free market. Thus the free rate continued to increase reaching 1.42 by mid June 1982, table (1).

Private dealers in the mean time were subjected to intense pressure by the Minister of Finance to bring down the free rate into more 'acceptable' levels - shortly after the dealers declared their inability to bring down the rate in June 19, 1986; the authorities moved by setting a maximum selling and buying, rate of LS 1.15/$ and LS 1.13/$ respectively. This move however did not only prove to be ineffective but also counter productive since it led to the re-emergence of the black market which already started since private dealers attempted to set an 'accepted' rate for the free rate. More importantly the move by the government seems to have shaken perception about government credibility and commitment to the reforms, a matter that led to the creation of a rent seeking group of 'trusted' middlemen, "through whom customers (citizens, private sector and some times even government units) would channel their demands for foreign exchange for a premium," USAID (1985).

As a result the authorities were forced to rescind the measure of fixing the market rate for foreign exchange in August 1982. In November 1982 the unified official rate was devalued to LS 1.30/$, and in November 1983 the policy of unified official rate was abandoned with a creation of a dual crawling peg set at LS 1.75/$. Foreign exchange dealings with this rate started with four licenced commercial banks. The number of licensed banks increased to 12 and the rate reached LS 1.8/$ by March 1983. On the trade side, 75% of exports were transacted through the official market (LS 1.3/$) and 25% at the dual official market (LS 1.8/$). For imports however an import priority list of a few essential goods were to be financed by the dual official market. This effectively left most of imports to be financed by the

free market. This new policy certainly implied a bias against exports since it forced their transacting through the two official markets. But it also expanded the current account link of the free market a matter which led to an even more depreciating free rate.

About mid May 1983, the authorities abolished the free market by revoking the licenses of the private dealers who were accused to have engaged into the harmful practices of hoarding foreign exchange. In addition to this major reversal on the payment side, imports were restricted and by July 1983, 39 import items were banned. As black market re-emerged to replace the former free legal market with the commercial banks unable to achieve any gains due to their lower administered rates; the free market was legalized and private dealers were allowed to operate again starting January 1984. This phase (January 1984-January 1985) was characterized by a vastly depreciating rate in the re-legalized free market, see table (1).

In an apparent attempt to improve incentives for export the authorities moved all exports (except cotton and gum Arabic) to the parallel official market. With the free rate depreciating so largely this move did not have a big effect either in terms of export expansion or reducing mis-invoicing or smuggling of exports. By January 1985, the Minister of Finance asked the dealers to reduce the free rate which reached a record level of LS 3.75/$. Just as before attempts by the dealers to fix or reduce the rate failed and the black rate rocketed to LS 4.90/$ in February 6, 1985, the day which witnessed the closing down of private dealership and subsequently all foreign exchange transactions were confined to licensed commercial banks. Foreign exchange held by the private dealers were collected by the authorities and was put at the control of the BOS. Private dealers were offered the choice

between using their foreign exchange for importing goods of their choice (subject to the approval of the Ministry of Commerce) or receiving its equivalent in domestic currency according to the prevailing dual official rate, USAID (1985).

4. Quasi-legalized Free Market: February 1985-June 1989.

The beginning of this phase is marked by a devaluation of the two rates in February 1985. With the official set at LS 2.50/$ and the dual at LS 3.30/$. The dual market rate was to be reviewed periodically by a bankers' Association committee. Between February 1985 to April 1987 this rate ranged between LS 2.5/$ to LS 4.00/$ while the black market ranged between LS 3.7/$ to LS 5.8/$.

All exports and government imports are transacted at the official rate. This leaves the rest of the imports to be transacted at the dual rate. The black market rate continued to be high and depreciating despite the successive tightening of import restrictions with the list of banned imports extended to 100 items by 1986. The flow demand for foreign exchange continued high to finance smuggling, capital flight etc. In October 1987, an official devaluation and attempted unification of the two rates brought the unified rate at LS 4.5/$. Also an "own resource" import system was introduced. One year later in October 1988 the dual rate was set at LS 11.30/$ and later increased to LS 12.10/$.

The sizable devaluation of the dual rate in October 1988, which set the dual rate equal to the black market rate prevailing at the time achieved some modest success in enhancing the transfer of SNWA remittances through the official channels and the black market premium declined but was not completely

eliminated however. Up to 1989 the black market though illegal but largely tolerated and as such quasi-legalized and its links to SNWA remittances and 'own resource' imports continued unimpeded. During the first six months of 1989 however, the authorities attempted to step up enforcement measures. This led to a jump in the black market rate to LS 20/$ by June 1989 as the perceived risk has risen.

5. Policy Reversal: July 1989-Present.

The current military regime in Sudan started off with a massive campaign aimed at weeding out the black market, not by economic means however, but almost exclusively through "policing the economy". Harsh measures were deployed to enforce the price and foreign exchange control, such as confiscation of goods, long term prison terms and even execution in the case of illegal holding of foreign exchange.

Despite their rigor of enforcement, these measures were once again not successful. In fact their impact on business confidence and remittance flows has been much more devastating than any previous enforcement attempts. The black market exchange rate has now reached LS 25 per US dollar, severe shortages ensued and the black market is still quite pervasive. The remittances transferred through the official channels are expected to decline by about 20% this fiscal year despite the strong enforcement measures.

APPENDIX II

A METHODOLOGY FOR COMPUTING CAPITAL FLIGHT IN SUDAN

Dornbusch (1985) defines capital flight as that part of the increase in gross external debt that is not utilized to finance current account deficit net of direct and long-term portfolio capital inflows, or to finance official reserve increases. According to this view capital flight is identified with net private short-run capital outflow. For the case of the Sudan our measure of the current account must include the unreported current account of the private sector, otherwise our estimates may substantially understate the true magnitude of capital flight. We do this by adding the unreported current account deficit (which is large and negative) to the following identity:

Increase in Gross External Debt
(net of amortization and interest payment) = [Official Current Account Deficit
+ Unreported Private
Current Acc. Deficit
- Direct and long-term
Portfolio Capital inflows]
+ Reserves Increases
+ Capital Flight

where unreported current account deficit is measured as the negative of the excess of SNWA remittances channeled through the black market over the value of imports financed by own importer's resources. These imports are reported and legal but they are not included in the official current account. Also the increase in external debt is adjusted for amortization and interest payment in order to exclude the capitalization of interest on arrears from the

measurement of the increase of debt. Inclusion of the capitalized interests on arrears -- which are substantial in the case of Sudan, has the effect of artificially exagerating the measure of capital flight.

The corresponding estimates of capital flight are contained in table (4) (column (1)). Even though our estimates of capital flight do not include mis-invoiced transactions on exports and imports (including smuggling), as well as expenditure on travel, education, etc. abroad, they nonetheless capture the main items in the credit and debt sides of the unreported current account, namely the flow of remittances through the black market and the 'own resources' imports. Still, however, these estimates can only provide an approximate view of the extent of capital flight in the Sudan. Another set of estimates for capital flight in the Sudan were computed in Ali (1988). These estimates were obtained as balancing residuals in the identity which sets resource mobilization equal to their utilization. Even though Ali's number are higher than ours, both estimates, however, reflect the same pattern of increasing capital flight over time.

APPENDIX III

EXPECTED LEVEL OF THE NOMINAL OFFICIAL EXCHANGE RATE

$$(A.23') \quad \hat{LOG}\, E_{0_{t+1}} = 4.62^{*} + \underset{(4.77)}{1.25} \log q_t + \underset{(1.65)}{0.52} \log q_{t-1} + \underset{(1.33)}{0.41} \log q_{t-2} + \underset{(2.72)}{0.76} \log q_{t-3} + \underset{(9.55)}{0.83} \log m_t + \underset{(1.74)}{0.97} \log e_{t-1} + \underset{(5.32)}{2.80} \log e_{t-2} + \underset{(1.51)}{0.59} \Delta \log E_{0_t} + \underset{(6.48)}{2.92} \Delta \log E_{0_{t-1}} + \underset{(3.81)}{2.69} \Delta \log E_{0_{t-2}} - \underset{(-0.26)}{0.13} \log E_{0_{t-3}} + \underset{(1.31)}{0.55} \Delta \log E_{0_{t-4}}$$

$R^2 = 0.91$, $\bar{R}^2 = 0.89$, $DW = 0.67$

* The constant term is adjusted for non-normality of the disturbance term by the factor $(\beta_3 / 2)^{1/3} = 0.059$, where μ_3 is the third moment of the residuals from equation (A.23').

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